

NOVEMBER 13, 1913

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Hence, the adoption of Truffault-Hartford equipment on the part of twenty-seven car builders was a shrewd move with a telling result. Women now speak

of these cars in terms of highest praise.

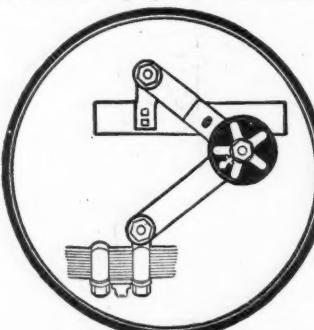
Dealers looking to their own interests cannot afford to ignore the woman's demand for comfort. It is she who often casts the deciding vote that closes a sale.

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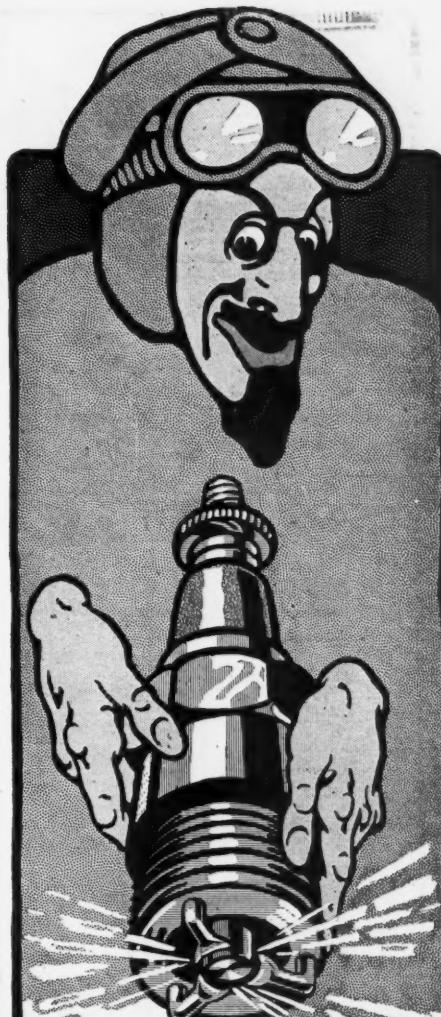
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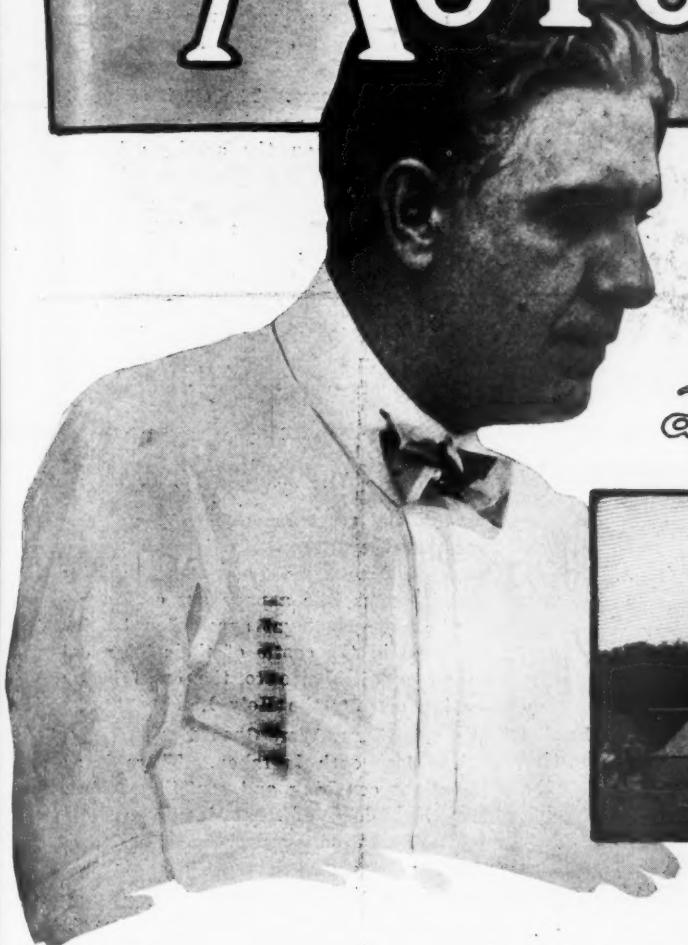
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MOTOR AGE

The Warden, the Convict and Good Roads



WARDEN ALLEN AND CAMP HOPE, FIRST CONVICT CAMP ESTABLISHED IN ILLINOIS

It usually happens, in the large affairs of life as in the lesser ones, that the end to which we so ardently set our efforts enriches us far less than the means we take in achieving it.—Ray Stannard Baker.

If you have read Dickens' "Barnaby Rudge," you remember Dennis, the hangman; Dennis, the connoisseur of human necks; Dennis, who inspected jugular veins, Adam's apples and cervical muscles with the enthusiasm of an art critic and exclaimed, with something akin to aesthetic rapture, "What a man to work off!" Although a character in fiction, Dennis is as real as the prison officials whom Dickens, as a reporter, met in the Old Bailey. Dennis was a practical penologist of the eighteenth century when debtors were thrown into jail and petty robbers built their own gibbets.

Crook Drama is Realistic

If you have witnessed a performance of Paul Armstrong's "Alias Jimmy Valentine," you will recall the prison warden in the first act. His voice was as harsh as his Atlantean shoulders were broad; his thick mustache bristled with authority; his clenched fist pounded a tattoo of discipline on his desk; his restless eyes were the eyes of a skeptic who has no faith

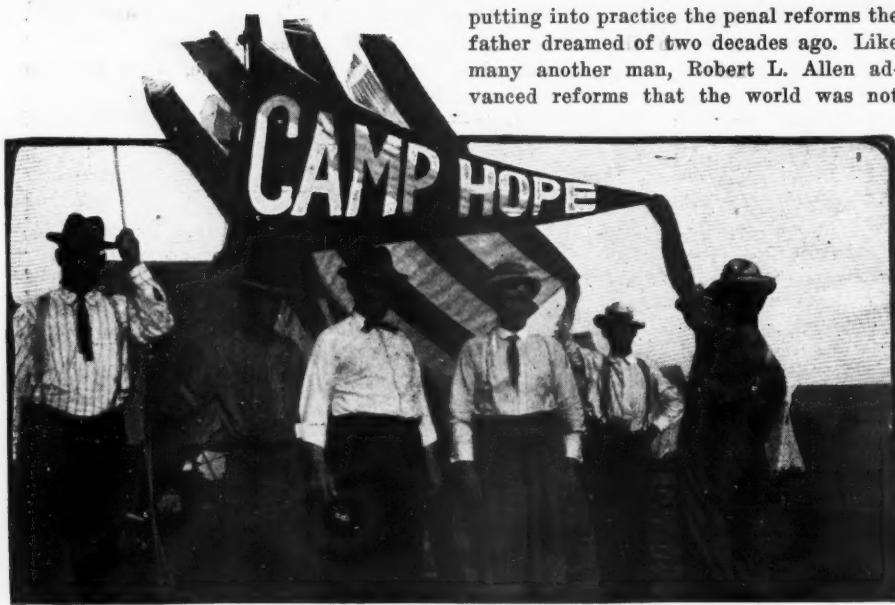
By J. C. Burton

THE most humane and sane of all penal reforms, the use of convicts on the highways, is sweeping the country. Within the past 3 years, few of the forty-eight states have not seen the wisdom of using prisoners to build and maintain public roads. In twenty-three states, the doors of penitentiaries and county jails have been opened and the inmates given an opportunity to work for the public good and for their own physical and moral betterment. The honor system, initiated by Thomas J. Tynan in Colorado, has been adopted by eight states, Utah, Montana, Wyoming, Washington, Oregon, New Mexico, Arizona and Illinois. Florida and Georgia have yet to put felons upon their honor and continue to guard their road-workers with armed officials. Arkansas, Delaware, Indiana, Kansas, Maine, New Jersey, North Dakota, Pennsylvania, Vermont, West Virginia, Wisconsin and Iowa are working prisoners upon the road under various systems.

in man. Only a player in a crook play, you say? Yes, and no. Armstrong knows Sing Sing as Dickens knew the Old Bailey. This warden is a practical penologist of the twentieth century, this era of sporadic reform and paradoxes in which we apply eugenics to children and golf to tired business men, but continue to condemn criminals to sunless cells and poorly ventilated workshops.

Penal Reforms Yet to Come

That society has progressed in the last 2 centuries, even in its treatment of criminals, there is no denying. The butcher, baker or candlestick maker cannot have you imprisoned for failure to pay your meat, bread or light bills. Purse-snatchers and house-breakers no longer are hanged. But there is room for further improvement. Pupils in the kindergartens of felony are cast into cells with alumni of the college of crime to eventually master a post-graduate course in lawlessness. The penitent murderer, who during the long days and restless nights



ILLINOIS CONVICTS RAISING THE FLAG AT CAMP HOPE

of a life sentence seeks to wipe from his hands the stains of his single victim's blood, must pay the same penalty as the Cain child who has killed from the lust of killing and will kill again if given his liberty and a gun or club. Penitentiaries are dark tombs of steel and stone where despair is welcomed and hope barred. "Once a crook, always a crook," is a commonly but erroneously accepted axiom. Old-school wardens continue to break the last fiber in the spirit of man with mailed-fist discipline and Satan-inspired routine.

But enough of sweeping statements, depressing and inviting criticism; enough of muckraking when there are encouraging exceptions—two especially noteworthy—to the general rule. One is Thomas J. Tynan and his Colorado honor system. The other is Edmund M. Allen, of Illinois, and Camp Hope.

A New Player in an Old Tragedy

Allen and Camp Hope, in fact, is the *raison d'être* of this article. Tynan and his honor system is a typewriter ribbon-worn theme. Allen and Camp Hope, on the other hand, have yet to attain national promipence. Their fame is measured in the agate lines of Illinois' newspapers, not in the brevier columns of widely circulated magazines. Like Tynan, Allen is a new player of a new role in a world-old tragedy. He has just made his debut in the sordid drama of penology.

Edmund M. Allen sits in the same high-backed chair that his father occupied 20 years ago. He writes at the same brass-studded desk that his father wrote at back in 1893. He is a penologist by inheritance and warden of the Illinois state penitentiary by appointment. Fittingly enough, the son is

putting into practice the penal reforms the father dreamed of two decades ago. Like many another man, Robert L. Allen advanced reforms that the world was not

cement floor of the narrow corridors. In the black hours of a slowly advancing morning the chosen of Allen are being marshalled. As each passes in solitary review before the pals he will leave behind him comes a chorus of hoarse-voiced appeals from a dozen bunks, "For God's sake make good!" It is not profanity. It is a prayer of men who either have not been taught or who have forgotten how to pray.

One hour passes. The clock strikes 3. The skies still are dark except for a splotch of red on the southern horizon where the belching flames of burning gas from the towering smokestacks of the adjacent steel mills are reflected. In the warden's office a strange and solemn ritual is being performed. Here stand the chosen of Allen, forty-five honor men, black and white, native and foreign born, educated and ignorant, murderer and sneak thief, peter-blower and leather-snatcher, gunman and second-story worker, defaulter and dip. With head uncovered and right hand raised, each pledges upon his honor as a man not to violate the trust imposed in him. Forget that they are crooks, let your imagination clothe them in crusader's armor and it seems like a page out of the history of the medieval ages when knights gathered in the castle of their liege lord to swear allegiance to the cross before setting out for the Holy Land.

When the Doors Were Opened

The last oath is taken. There is an impatient coughing and scuffling of feet. The last door of that liberty-mocking succession of bolted doors is opened and the chosen of Allen walk out into the wholesome air of the early morning, out into a darkness that is as black as the darkness from which they came, but a darkness that is not for long. In 2 hours they will greet, not through barred windows but standing in the great out-of-doors, the dawn that inspires the birds to carol matins. In 2 hours they will be warmed by the timid rays of a rising sun that gives life to flowers and gladdens the heart of man.

Watch them as they walk on the dew-lustered grass of the prison yard. Each carries his head high, as a man should carry his head. They walk as men who have a responsibility but do not fear it. There is confidence in each buoyant step; determination in the weakest jaw. And were hope a tangible thing, an X-ray photograph of each heart would show that organ bursting with it. What a transition is this! These are the same men who

saw yesterday in the broom shop and shoe shop. But they walk differently today. Yesterday despair weighted their feet and the yoke of dismay was



ILLINOIS CONVICTS LEAVING PRISON TO GO TO CAMP AT GRAND DETOUR

about their necks. They walked as if they did not care where the next step took them. They hung their heads, not in shame but in desperation. Yesterday, in the prison, they were creatures forced and driven. Today, out in the open air, they are men inspired with hope.

And now we leave them as they walk into the dawn and to the waking city where they will board an interurban car for a 5-hour ride to the historic village of Grand Detour, quaint and tranquil town of towering elm trees and weathered stone houses, a fitting destination for the chosen of Allen.

Raising Camp Hope's Flag

Comes Sunday. Three days have elapsed since the memorable morning on which the two score and five honor men set out from the penitentiary to start life anew. Much has been accomplished in the interim of 72 hours. Tents have been pitched, supplies unloaded, a venerable pine tree cut, stripped of its branches and set up as a flag pole. Prison pallor has been changed to sunburn. Forty-five bronzed faces, ninety brown hands form a priceless testimonial to the healing powers of the greatest of alchemists, sunshine and fresh air. Sweat, the sweat of invigorating toil, has run down those bronzed faces. Blisters, marks of honorable labor, have been raised on the palms of those brown hands. Already pick and shovel have been applied to a 1-mile stretch of hilly rural road that will be widened and graded before the first blizzard of winter sweeps down from the too generous north.

It is a day of rejoicing. There is to be a flag-raising. Gathered around the swaying staff of pine are the chosen of Allen, each wearing the black suit and boiled shirt of the law-respecting laboring man. Ninety hands grab a slender rope. There is a tug, a cheer and two banners are run up the pole. One is the flag of freedom, with thirteen stripes of alternate red and white and forty-eight stars on a field of blue. The other is a flag of faith, a blue pennant on which are inscribed in letters of white the words, "CAMP HOPE."

The first convict honor camp—a camp without a leg iron, handcuff, ball and chain or armed watchman—in the history of Illinois has been dedicated and hope has been kindled not only in the hearts of the forty-five participants in the flag-raising but also in the breasts of approximately 1,800 felons who, behind the bars at Joliet, are waiting the glorious day when the door will be opened for them and they, too, may go out into the sunshine.

So much for reminiscence.

Illinois is the ninth state of forty-eight commonwealths in the Union to adopt the honor system of convict road labor, following the lead of Colorado, the pioneer, and Utah, Montana, Wyoming, Washington, Oregon, New Mexico and Arizona. Georgia and New Mexico also work con-

victs on the state highways but employ armed guards to watch the felons and house the criminals in bull pens instead of tents.

In addition, twelve other states—Arkansas, Delaware, Indiana, Kansas, Maine, West Virginia, Wisconsin, New Jersey, North Dakota, Vermont, Iowa and Pennsylvania—have passed laws allowing the use of convicts in the construction and repair of the highways during the past year.

The feasibility of convict labor on the highways was first shown in 1909, when a gang of prisoners from the Georgia state penitentiary built the road race course on the outskirts of Savannah. This circuit, dedicated to the gods of speed, proved to be one of the finest pieces of road in the country, although constructed at a very low cost.

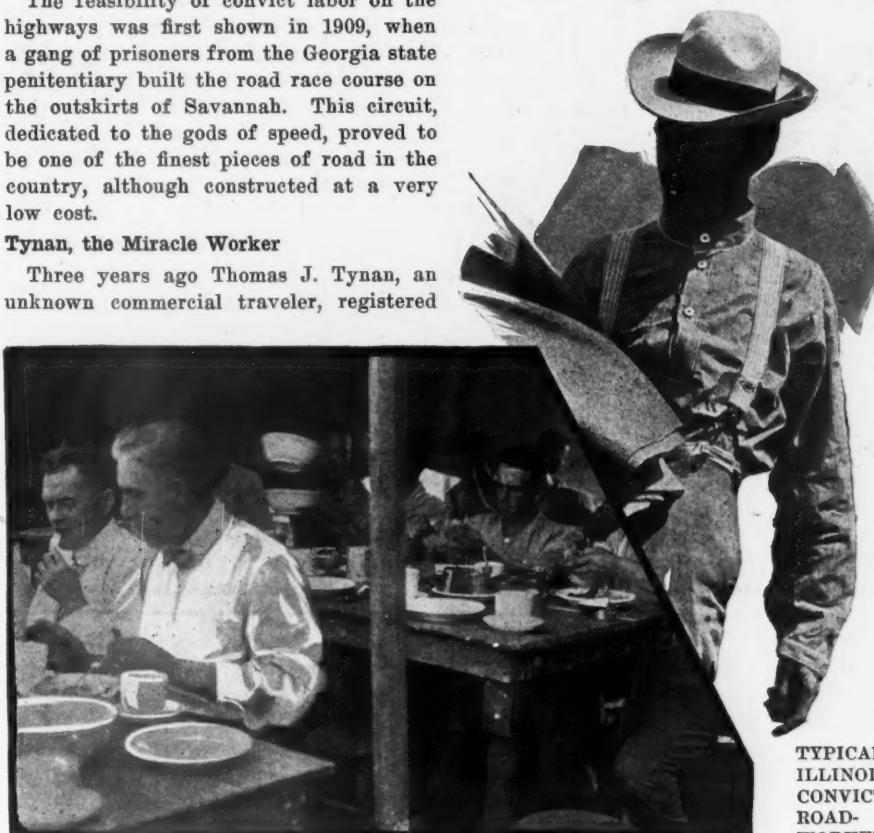
Tynan, the Miracle Worker

Three years ago Thomas J. Tynan, an unknown commercial traveler, registered

sent to road camps have violated their pledges by successful escape.

What Tynan has done, Allen hopes to do.

Camp Hope still is an experiment, although it has been in operation for more than 2 months now. Warden Allen is encouraged but not satisfied. Not until the doors of the prison are opened for the hundreds of convicts who have yet to have an opportunity to make good will he consider his ambitions fully realized.



TYPICAL
ILLINOIS
CONVICT
ROAD-
WORKER

WARDEN ALLEN EATING WITH CONVICTS AT CAMP HOPE

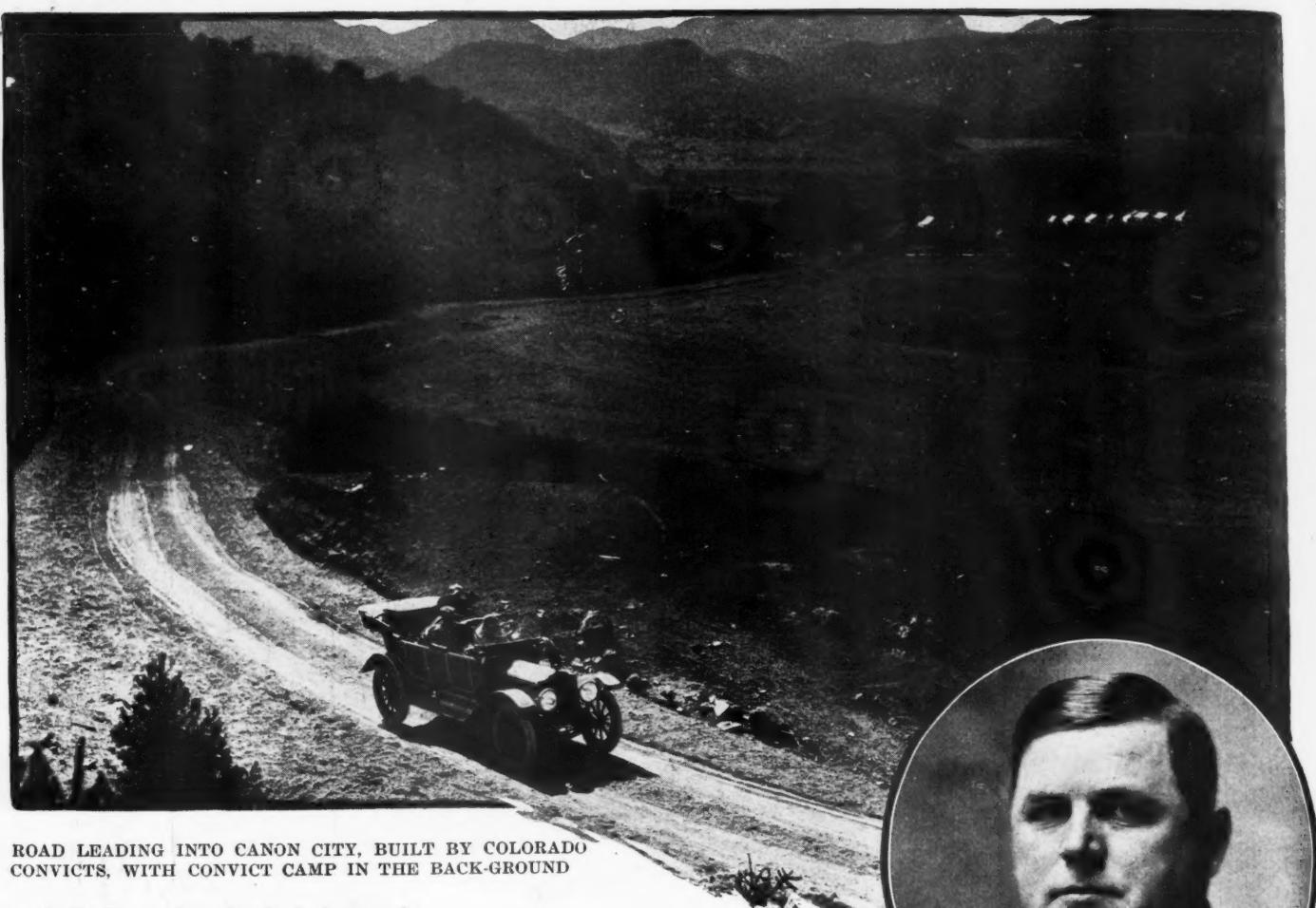
at the state penitentiary at Jefferson City, Colo. He was appointed a warden. He proved to be a miracle worker. Soon after his appointment he established the first honor camp in the United States. The story of his success as a penal reformer is written on the ledges of the Rocky mountains, which have been changed from tortuous trails to broad boulevards.

Saving Men and Money

Tynan's achievement can be told in cold statistics. In 3 years he has worked over 1,000 prisoners on the roads of the state at a cost of 47½ cents per day per man. Fifteen hundred miles of road have been built or improved. Such figures prove his system an economic success. But he has accomplished something more. He has made manhood as well as money. He has built up prisoners both physically and morally. Over 80 per cent of his honor men who have been released on the completion of their sentence have made good. Less than 1 per cent of the 1,000 prisoners

Camp Hope is but the foundation for a greater camp to be established eventually.

At the present time there are approximately 1,850 male prisoners serving time in the Joliet penitentiary. Of this number only 250 convicts are engaged in outdoor occupations, laboring inside the mocking stockade of the stone yard. Of the remaining 1,600 felons, about 300 are considered hopelessly incorrigible by Warden Allen. They are defiant, desperate, untrustworthy. They are neither remorseful nor desirous of reforming. If sent to a road camp, they would repudiate their oath, sacrifice their pals and make a break for liberty at the first opportunity. Another 500 men are indispensable cogs in the operative machinery of the institution. They could not be spared from the engine rooms, bakery and kitchens. But what of the remaining 800 prisoners, the well meaning but despair-ridden 50 per cent, who are working in the broom, chair and shoe shops? Why are they not out in the open air improving the deplorable highways of the state instead of laboring



ROAD LEADING INTO CANON CITY, BUILT BY COLORADO CONVICTS, WITH CONVICT CAMP IN THE BACK-GROUND

methodically and uninspired in poorly lighted and inadequately ventilated workshops, where spirit is broken, hope throttled and health impaired at little, if any, profit to society?

You will find the answer in the statutes of Illinois. The members of the state legislature, wrestling with a new problem and accepting inevitable penal reforms with tolerance rather than sympathy, decreed, in the convict labor road law, that no prisoner owing the state 5 or more years could be worked on the highways. What an opportunity to roll a moss-covered stone from the doors of a tomb of living death the overly cautious lawmakers overlooked!

The Dream of the Lifer

As long as this unjust law remains upon the statute books the lifer and long-term prisoner will continue to work and sleep, sleep and work day after day in the stronghold of stone and steel, with no higher incentive to obey prison rules than the fear of confinement in the solitary. When this law is repealed and a more just one substituted, they can go out into the sunshine and make good in the ranks of the honor men, with hope, instead of fear, spurring them on.

"It is Governor Dunne's ambition, as well as mine, to wipe the 5-year restriction law from the statute books and replace it with a law that will give the lifer and the long-terminer a chance for his white alley," said Warden Allen to the writer recently. "The life prisoner, almost with-

out exception, is the most trustworthy of all convicts. A lifer drives my motor car. A lifer sits at the desk in my outer office. A lifer waits upon me at my table. Any one of the three could walk off unchallenged, yet they never have violated the trust imposed in them. They have proven themselves worthy of the title and privileges of honor men, but the law specifies that these convicts cannot be sent to a road camp.

"I cannot help but sympathize with the lifer. He is cast in the same mold as you or I. I can look back and recall times when I would have committed the same crime as he is guilty of had I had a revolver in my pocket or a club in my hand. I clenched my fist and struck a blow; he pulled a trigger or wielded a club when crazed with anger. Temporarily insane when he killed, he was truly repentant 10 minutes afterwards. Yet, because he was unfortunate enough to have a revolver or club when he was provoked to raise his hand, he is condemned to die within the walls of this penitentiary, to go out in a shroud unless pardoned before the end comes. Would it not be better for him, and for society generally, to send him to a road camp, give him an opportunity to make good in the eyes of the very men whose law he has broken, make him a useful servant instead of a despondent parasite, prolong his life instead of shortening it?



WARDEN TYNAN OF COLORADO, ORIGINATOR OF THE HONOR SYSTEM

"Governor Dunne is co-operating with me in a campaign for a more liberal law, a more humane law, a law that will permit the lifer to work in a road camp. There are obstacles in the way. There is the lobby. Professional road-builders will fight any attempt that is made to increase the scope of convict labor on the highways. There are the old-school politicians, ever fearful of the consequences of any reform measure. There are the ignorant members of society, who would regard the establishment of road camps throughout the state as an attempt to institute a reign of terror and put a premium on crime. You would be surprised if you knew how many people there were that still cling to the belief in the antiquated fallacy, 'Once a crook, always a crook.' **Obstacles Must Be Overcome**

"But I believe these obstacles can be overcome. We are preparing to overcome them now. The boys out at Camp Hope are entitled to a great deal of credit for what they have done in furthering this campaign of education. I knew that they would make good when I selected

them, but I never dreamed that they would realize the responsibility that I placed upon their shoulders as they have. They know that if they fail, I fail, and that if they make good, the men they left behind at Joliet may have a chance to make good, too. They have helped to create the atmosphere here that I hoped to create, that atmosphere of hope that I know exists every time I walk through the yard and the men stop me to ask, 'How is the bunch getting along at Camp Hope, warden?'

Ten Camp Hopes Are Planned

"When I established Camp Hope, old-school penologists paid me a compliment by declaring, 'This Allen is as nutty as Tynan.' I guess they will recommend that I be examined by alienists and committed to the hospital for the insane in the spring if I am allowed to carry out a plan I am now formulating. I aim to establish not one Camp Hope with forty-five workers but ten Camp Hopes with a total of 500 laborers and to improve not 1 mile of road but 100 miles of highway.

"The camps will be established 10 miles apart on a road connecting Springfield with some other city or town 100 miles distant. My reason for selecting Springfield as one of the terminal points is because I wish to interest the members of the legislature in the work. I know of no better way to accomplish this than that of placing the camps and making improvements adjacent to the state capital, where the representatives and senators can inspect the camps and road work most easily and at least expense in time.

"I am confident that once the legislators see how feasible and profitable convict highway labor is, they will amend

the present law and give Illinois a law without a restrictive clause, a law such as is now in force in Colorado. Then, and only then, will the lifers and long-terminers have a chance to make good, a chance that all men, be they law-breaking or law-abiding citizens, are entitled to have.

Prison Supplies Road Material

"The penitentiary at Joliet has contributed more than labor to the good roads movement of the state. We are working 250 men in the stone yard and furnishing crushed stone to all counties which will pay the transportation costs. I plan to increase the scope of this work in the spring. The prison commission has purchased a large section of land across the river for a new penitentiary site. This land is rich in gravel beds. The legislature also has appropriated money for the purchase of crushers. As soon as the weather permits, I will work 500 men on these new gravel beds, doubling the present output of road-building material.

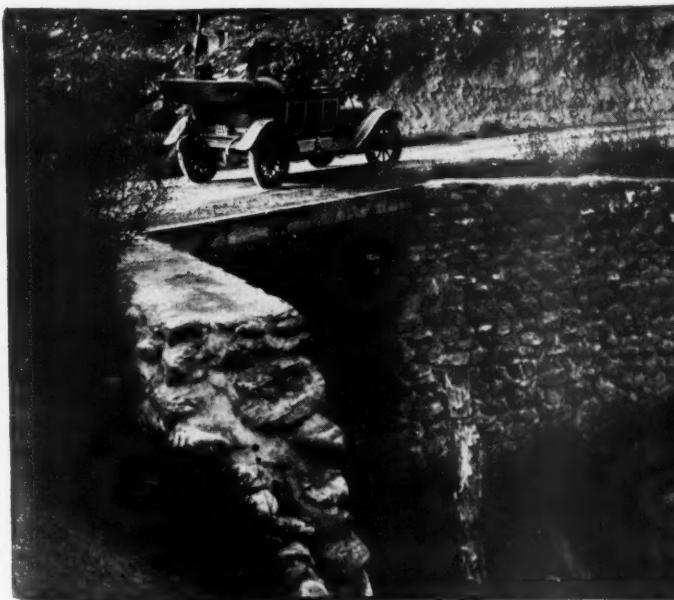
"We are fortunate in having a firm foundation on which to build for the future. Camp Hope has been a success, and I measure this success in other than material results. When I sent the forty-five men to Grand Detour, I asked myself this question, 'Will the people of Illinois and other states give these convicts a chance when their terms are over?' Two months ago I feared a negative answer. I have received an affirmative one.

"Almost every day I find on my desk letters from manufacturers and

business men who write, 'Just as soon as a Camp Hope man completes his sentence send him to me with a letter, stating that he was an honor prisoner, and I either will give him employment or help him get a job.' These men will not be forced to steal and rob in order to eat and sleep. They never will play the part of fall guys for detectives, who pick up ex-convicts for crimes others have committed and railroad them to prison to show superiors that they are on the job and earning their pay. With such co-operation, eventually I could depopulate the Joliet penitentiary. My one regret is that I have only forty-five men to recommend instead of ten times that number."

Illinois' Penal Conditions Peculiar

Warden Allen is a modest man. He does not pose as a revolutionist or reformer. "I have only adopted Tynan's system, with some limitations," are the words with which he refuses a crown of praise. But he has done more than adopt the system of a contemporary penologist. He has adapted that system to conditions peculiar to Illinois and several other commonwealths, who recruit the majority of their convicts from crime-infested cities of 1,000,000 population or more. For that



TYPICAL COLORADO SCENES SHOWING CONVICTS' WORK ON THE ROADS

The upper right-hand illustration is from a photograph taken near Pueblo and shows the convicts finishing up one of the highways. The lower left-hand illustration is a sample of the bridge construction work done by the convicts. This is an iron girder bridge on the road between Canon City and Colorado Springs. The road is built right over the girder, making it a substantial road surface. In the lower right-hand corner is another sample of convict work, a concrete bridge on the Big Plain near Fairplay

reason Allen should be ranked with Tynan as a pioneer in penal reform.

The convicts of Colorado are of a different breed than the convicts of Illinois. The criminal elite of Joliet—Allen calls them his "high-class crooks"—look with disdain upon the felons of the western state and term them "boobs." The half-breeds, the Mexicans and petty offenders of which the Colorado convict camps are largely composed, lack the finesse, the daring, the finer lawless instincts that have made the Chicago safe-cracker, gunman and queer-passor, now boarding at the public's expense, masters in their nefarious arts.

Smart Crooks Intensify Problem

"I do not wish to appear as attempting to take any of Tynan's credit from him," Warden Allen said, "but I honestly believe that his task of selecting honor men for road work is much easier than mine. He deals with an entirely different class of criminals. Many of his men not only are ignorant but are serving their first sentence. A large percentage of the prisoners at Joliet either are what I call 'smart crooks' or old offenders. They have been in 'stir' so many times that they are homesick when they are out of prison. All their life they have taken advantage of other men's mistakes.

"I must be careful that I don't make a mistake of which they can take advantage. Although I am confident that the

majority of these 'smart crooks' would appreciate my motive in sending them to a road camp and would keep their pledge even if they had no intention of reforming, I cannot select my honor men promiscuously, for I have a lot of black sheep who could not resist the temptation of running away.

"There is another point to be considered in comparing conditions in Colorado and Illinois. Tynan works his men in isolated regions, in the mountains, where a clean getaway is almost impossible. I must work my men near towns and cities, where the members of the old gang to which the convict road-worker belongs can assist him in making his escape and cover up his tracks so that his recapture cannot be effected. My judgment in human nature is not infallible. I expect to pick honor men who have no honor. But I am going to exercise care in the picking in order that the number of violations of pledges and the attempted escapes may be reduced to the minimum.

Solving Other States' Problem

"That is why the Illinois convict road system is still an experiment. I have put only forty-five men to the test. They have made good. But their splendid record may be spoiled when I increase the number of honor men to 500. I am not a skeptic, but, again, I am not a prophet."

If ten Camp Hopes are as successful as one Camp Hope, if 500 honor men prove

as worthy of trust as forty-five already have, Warden Allen will have solved a problem not only for Illinois but for New York, Pennsylvania, Massachusetts, Ohio, Missouri, Minnesota and California as well, for in these states the same conditions exist as in Illinois, where the high-class crook from the large city is an important and feared factor in a liberal reform system such as Warden Allen favors.

Honor System Is Inevitable

A universal honor system of convict labor on the highway seems inevitable. Nine of the forty-eight states already have adopted it. They are giving the crooked man a chance to straighten out a crooked highway and a crooked life at the same time. Instead of meting out punishment to criminals, wardens like Tynan and Allen are working for the redemption of criminals, inspiring them with hope instead of fear. In their systems of convict road labor, the end and the means both are justified. I cannot help but feel that the intangible results, the means, are of greater value than the material results, the end.

The material results can be computed in the increased miles of public highway and the saving in dollars to the taxpayer. The intangible results cannot be estimated. Who can measure hope with a tape line and put a price on the saving of manhood?

Recent Paris Salon Reports Attendance of 400,000

Gate Receipts for 11 Days \$58,317

PARIS, Oct. 28.—With 290,000 persons having paid for admission at the turnstiles, the fourteenth Paris salon came to a close last night, after having been open for 11 consecutive days. Taking into consideration the persons who had season passes and exhibitors' tickets, it is estimated that the number of visitors to the Grand Palais during the show period has not been less than 400,000. Gate receipts total \$58,317, the price of admission on the first and the last day being \$1, 60 cents on another day and 20 cents during the rest of the period.

It is generally admitted that the 11-day mid-October show, conducted on economical lines with uniform decorations, has been a huge success. From a manufacturers' standpoint this change of date has been satisfactory in eliminating some of the slack period in the factories. The October date has been most suitable for demonstration purposes. During the whole of the time the show was in progress fine weather prevailed and it was possible to give prospective customers demonstrations in the parks and surrounding country under ideal weather conditions. This really is an important matter in clinching sales.

An interesting angle of the show was the count made by the Rudge-Whitworth people, who gathered wheel statistics.

According to this, there were 801 cars displayed, of which number 447 carried wire wheels. Rudge-Whitworth had their product on 133 of these, Dunlop had 124, Riley 21, while the remainder were divided among other makes. Of the 801 cars, 504 were shown by car manufacturers and 297 by body builders. A review of the statistics shows the following:

Wire wheels	447
Steel wheels	31
Wood wheels	319
Disk wheels	4
	801
Detachable wheels	408
Detachable rims	38
Fixed wheels	355

Dealers, and particularly those from foreign countries, have been very prominent at the show. Undoubtedly numbers of those who under previous conditions would have visited the London exhibition have preferred to come to Paris for the first sight of the 1914 models. The only note of discontent appears to come from the motorcycle, cyclecar and accessory dealers. As these deal more or less directly with the customer, they claim that the October date is too early. Purchasers of these small machines generally wait until the winter is over before making purchases, thus less business was done in the Grand Palais than might have been expected. Where trade has been done through deal-

ers, the results have been most satisfactory. Manufacturers spoken with on this point claim that signed contracts for 1914 are 15 to 50 per cent higher than for the present year. Eastern politics being more settled, all the indications now are for a booster season.

QUAKERS SELECT SHOW DATES

Philadelphia, Pa., Nov. 8—Philadelphia's thirteenth annual show will be held during the week of January 10-17, 1914. In making the announcement of the date and preliminary plans for the exhibit the show committee of the Philadelphia Automobile Trade Association also announces several departures in the forthcoming exhibition over those of former years. First and foremost of these is that the show will for the first time be staged on one floor. This year the show will be staged in the new Metropolitan building at the southwest corner of Broad and Wallace streets, now in course of construction and nearing completion. Ample space will be afforded by this structure to accommodate all the cars on one floor.

Another innovation is that instead of showing pleasure cars for 1 week and commercial cars the following week, the exhibition will be confined to pleasure cars and will be limited to 1 week.

Engine Starters and Bodies Interest Britons Most

Twelfth Annual Olympia Show Now On—All Nations Represented

ONDON Eng., Nov. 8—Special cablegram—England's greatest motor car exhibition opened today at Olympia, with the chief interest of the large crowd of visitors centered in engine starters and new bodies. This is the twelfth annual motor show under the auspices of the Society of Motor Manufacturers and Traders.

Despite the fact that the amount of space occupied and the number of exhibitors at Olympia is much smaller than at the Paris salon, England's gallery of motor cars and accessories is considered more truly representative of current practice than is the larger affair which just preceded it. This is because there is a wider representation of makers from the different motor manufacturers at the annual exhibitions here than at those of the Grand Palais of Paris. Olympia receives the support of every nation that has a motor car industry worthy of the name, and by its comprehensive representation outclasses the exhibition of any other country.

In the nationality of the 126 exhibitors of cars and chassis at Olympia, England naturally heads the list with forty-nine, France is second with thirty-six; America has eleven; Italy and Belgium, nine each; Germany, eight; Switzerland, two; and Spain, Holland and Austria, one each. In view of the cosmopolitan nature of this representation, engineers have come to look for England's annual show as a criterion of the motoring industry as a whole.

In addition to the cars and chassis there are 148 parts and accessories makers exhibiting, in addition to the 370 tire and wheel firms. It is a remarkable feature of the exhibition to American eyes that the exhibits of tires and wheels alone are more than three times as many as all of the other accessories together.

The present exhibition is worthy of notice from one fact, and that is that there are few cars of revolutionary design. The adopted style of construction is the vertical engine placed in the front of the chassis, the amidships gearset and the bevel or worm-driven axle. Past shows always have witnessed the efforts of several radical spirits who exploited designs which were anything but conventional.

The one direction in which the mechanical side of the construction exhibits a tendency away from standard practice is in the adoption of motor cranking devices, although, at the moment, the Yankee idea has not met with the favor among manufacturers that many Europeans expected. Six different makers are showing cars or chassis fitted with electric cranking apparatus. These are the Arrol-Johnston, Sheffield-Simplex, Daimler, Armstrong, Lanchester and Siddeley-Deasy. It seems to be the general opinion among engineers that the majority of the English cars will

By J. S. Critchley
President Institution of Automobile
Enginers

follow this lead and join the self-starting ranks.

Electric lighting equipment is found on a large percentage of the cars. Very rarely, however, is this what may be termed stock equipment, for European cars quite often are sold as the bare chassis without body, tires or equipment. Provision for attaching electric lighting generators, on the other hand, is a feature of almost every chassis, though many of them do not permit of anything but belt drive.

Among the attractive new models making their debut at Olympia may be mentioned the 20-horsepower Daimler and the 12 and 16-horsepower Darraeqs. The non-poppet type of engines have two new converts, the German having adopted the Knight sleeve valve, while the Maudslay has the Reno sleeve-valve motor.

There are very few alterations in general design, chief improvements seeming to have been in the matter of suspension, bringing with them a noticeable gain in favor of the cantilever type of spring. The electric vehicle as known in America is not nearly as popular as it is in the United States, but the Arrol-Johnston Co. has added to its line an electrically-propelled coupe having an Edison battery supplementing its gasoline cars.

British makers, and those on the continent as well, are favoring to a greater extent dry clutches and crankease chambers with ribs cast upon them to assist in cooling.

Stripped chassis are not so much in evidence this year as formerly, and consequently there is an even greater display of coachwork than heretofore. Streamline bodies prevail in all types of cars and there is a considerable gain in the popularity of the adjustable front seats. There are many novel color schemes and startling effects are produced in black and white. The very light colors are considered very fashionable for touring cars. There are many novelties in window fittings and interior furnishings and bodies are more costly and luxurious.

BOSTON BILLS ELECTRIC SALON

Boston, Mass., Nov. 8—The first electric motor car salon ever held in Boston is scheduled for the Copley Plaza ballroom here on November 17, 18 and 19. It is to be promoted by the Electric Motor Car Club of Boston and President Day Baker has appointed committees to take care of it. The plan is to make it somewhat of a society affair, for the tickets are to be \$1 each and there will be no advertising of any kind except the

catalogs of the cars. A reception committee will be on hand to escort visitors through the salon and describe each exhibit, but without any solicitation to place an order. If a visitor becomes interested in any particular car and enters the space where it is being shown then the salesmen there may talk business and seek an order. Plans have been made for providing parking spaces in the rear of the hotel for cars of the visitors, and they will be checked there, with a policeman on guard to see that they are not molested. An orchestra will furnish music. There will be about forty machines exhibited. The following firms will be represented by the cars named: Bailey, S. R. Bailey & Co.; Baker, Frank N. Phelps; Buffalo, W. L. Russell Co.; Columbus, Imperial Motor Car Co.; Detroit, Anderson Electric Car Co. of Boston; Ohio, D. C. Tiffany & Co.; Rauch & Lang, Peerless Motor Car Co. of New England; Standard, W. H. Stevens; Waverley, J. W. Bowman Co.; Woods, Whitten-Gilmore Co.

WEED ENJOINS PERRY

Detroit, Mich., Nov. 11—The Weed Chain Tire Grip Co., New York, has secured an injunction against the Perry Chain Mfg. Co., Lansing, Mich., restraining the latter from making a certain type of non-skid chains for motor cars which is held to be an infringement of the Weed patents. The decision was handed down by Judge Tuttle in the United States district court at Detroit. The Perry concern states that it expects to make an appeal from this ruling.

ROSE DECREE MADE FINAL

New York, Nov. 10—A decision rendered on January 23, 1913, in the United States district court for the district of New Jersey by Judge Cross in the suit of the Rose Mfg. Co. vs. the E. A. Whitehouse Mfg. Co. and the Le Compte Mfg. Co. dismissed the bill of complaint with costs. The bill alleged infringement of the Rosenbluth and Hughes patents owned by the Rose company by the defendants. An appeal from the decree was made by the Rose company, charging infringement of two mechanical patents and two design patents. Both of the mechanical patents relate to brackets arranged to support a lamp in detachable relation to a vehicle body, such as are adapted more especially for use on motor cars, to support and illuminate the number of license placed thereon. The design patents are stated to be for new and original ornamental designs for vehicle number-plate supports. The court has now handed its answer to the appeal of the appellants, stating that the decree of the court below is affirmed.

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

Validity of Registration Law

THE Ohio State Automobile Association is waging a fight truly national in character in which it is aimed to restrain the secretary of state of Ohio from collecting registration taxes on motor cars, and victory has come to its initial efforts in that a Franklin county judge of the state has decided that the present high rate of registration in Ohio is illegal and really constitutes double taxation. The judge in reaching this decision does so on the ground that the present Ohio registration rate not only provides enough money to defray the cost of registration but also sufficient money to be used in road construction and maintenance. He further is correct in holding that moneys for road construction must come from a common tax and not a special registration tax. In that motor car owners in Ohio pay a personal property tax it is *prima facie* evidence that they are burdened with the double-taxation load against which they are protecting.

ALTHOUGH this Ohio fight has not yet reached its final stages, this initial victory demonstrates that the injustices of certain abnormal motor car registration fees is at least filtering into the ears of the judiciary. Should this Ohio county decision be sustained in the supreme court of the state it will stand as a sufficient precedent in the legal world to cause motorists in every other state where high registration fees and personal property taxes are imposed to get busy and see what can be accomplished.

IT has been a general under-current of conviction that states have not any right to charge registration fees in excess of the cost of the department, and New York and a few other states made it an agreement with the legislation that where a nominal registration fee is imposed it has been in lieu of personal property tax. These states have a much lower registration fee than some other states in which the motorist pays a personal property tax, and pays a wheel tax for the use of the highway in addition to the registration fee. In such states the warfare against illegal double taxation should be taken up with renewed effort. Give Ohio assistance and if the supreme court in Ohio backs up the movement there is a fighting chance that better justice will be meted out in other states in the immediate future.

The Car Body and the Artist

ONE year ago a leading American maker remarked, "We do not have to change our body lines for 1913 to make sales, our chassis is so superior that it sells itself." This fall this same maker has announced that he has employed an artist—that is the exact word he uses—to design new bodies for the coming season. He has engaged an artist, not a body artist but a pen-and-ink, an oil-color, a water-color, or whatever other names of artist you wish to call him. One of this artist's qualifications is that he does not know mechanics, it is questionable if he could tell the carburetor from the magneto, yet he is going to design a body; design a body that will appeal to the women buyers, to men buyers, a sensible selling body. This maker is in line for congratulations; he is on the right track, providing that he has a good safety valve and does not let his artist run away with his business in designing such a body.

A RECENT visitor from the Paris show commented on the exceptionally attractive bodies of an English builder who never has had a reputation for neat chassis design and wondered how it was possible to bring such a superior body creation out of a factory that was responsible for such a chassis monstrosity. A few questions brought out the fact that some years ago a French artist had been engaged and was entirely responsible for the body lines, which were given credit for many of the company's sales.

MORE of these body artists are needed, artists who do not impose impossible creations, but rather artists who are past masters in the dynamics of correlating curves and straight lines; and who have that perspective of area and boundary that these two can be combined into a pleasing form and yet not a form that cannot be adapted to a six-cylinder or a four-cylinder chassis or to a cyclecar chassis.

IT is a mistaken conception of some of our would-be body artists that graceful lines are at variance with utility and strength. All of the examples that nature gives us show these combined, and there is not a reason why the beautiful cannot be combined with the useful and the enduring in body work. It can. It takes an artist to do it. Those concerns that waken to this status of affairs and do not lose time in getting into the vanguard, will cash in by such an enterprise.

The Cantilever Spring

THE British show at Olympia which opened last week and which is the most international motor exhibition of the year shows that to the British buyer the better spring suspension is one of the major features in need of improvement in the car today. The spring suspension has been generally improved on British cars, and it would seem as if the cantilever type which was brought out by an English maker 10 years ago and used consistently ever since is coming into its own. This particular spring which Lanchester pinned his faith to a decade ago has had an up-hill route until a year or so ago when some other European and American firms took it up. During these long 10 years, since its introduction, its merit as a suspension has been recognized, but for some inexplicable reason never was taken up. Now it has had the spotlight turned on it and a year hence its adherents will be counted by the scores.

THE cantilever spring has demonstrated in rough work its superior suspension in that it reduces the vertical vibration one-half for a given result. It has another innate advantage, in that the weight of the spring itself is carried on the car frame, so that it is sprung weight and not dead weight on the axle as is the case where one of the other spring types is secured direct to the axle. Suspension engineers argue that the more the dead weight on the axle is reduced the greater the tire weight.

THE cantilever spring type was used in America on some of the earlier models, but its path to renown was obstructed by the semi-elliptic type that got the public eye. Today its return to favor is an example of "turning to a first love."

Canfield Spark Plug Claim Declared a Basic Patent

Mosler Wins in U. S. Court of Appeals

NEW YORK, Nov. 11—Special telegram—Judge Lacombe, sitting in the United States court of appeals, has handed down a decision declaring A. R. Mosler, the Spit-Fire spark plug manufacturer, the holder of basic patent of spark plugs which have a deep chamber or recess around the electrodes, the result of the suit being the outcome of 4 years of fighting of the Mosler concern against several accessory companies. According to the attorney for A. R. Mosler, W. A. Redding, every spark plug manufactured or sold in this country is an infringement of the patent Mosler holds and which was the issue in this case.

This patent originally was issued to Frank W. Canfield, on October 18, 1898, and was at one time owned by the Olds Motor Works, who assigned the same to the Association Patents Co. in 1906. This company was a subsidiary of the old A. L. A. M., which also controlled the Selden patent. In 1909 the Association Patents Co. assigned the Canfield patent to A. R. Mosler, manufacturer of Spit-Fire spark plugs. During the spring of 1909 this patent was widely advertised as broadly covering all spark plugs which had a deep chamber or recess around the electrodes, and a warning was issued to probable infringers that the Mosler company was the only one licensed under the Canfield patent, which the court of appeals has just decided basic.

On September 9, 1909, Mosler brought suit against John Lurie, doing a motor car accessory business, in which Lurie was charged with selling spark plugs which were infringements on the Canfield patent held by Mosler, and accordingly damages and injunction were asked for. Lurie claimed that the spark plug he was selling did not infringe and the patent itself was invalid by reason of anticipation, and in support of this claim about seventy-five American and foreign patents were

cited which Lurie claimed anticipated the Canfield patent.

During the next 2 years the attorneys for both sides spent many months preparing testimony for suit and examining other spark plug patents. The case finally was up before Judge Mayer in the United States district court in June, 1912, and the decision rendered in October, 1912, which said the defendants were selling or manufacturing spark plugs which were not infringements on the Canfield patent.

The Mosler company, however, appealed the case, which was just decided in the United States court of appeals, Judge Lacombe sitting. This court held that the Canfield patent, No. 612,701, was basic. The Canfield patent covers two claims, as follows:

"In a gas, oil or vapor engine igniter or sparkler, a recess or counterbore around the electrode or electrodes, above the sparking point or points when said electrodes are used vertically for the purpose of preventing an injurious accumulation of the products of combustion or other foul matter on the insulation of said electrodes."

The second claim is for a recess or counterbore of such depth and size as to form space for an air cushion and prevent the circulation of the explosive mixture into such counterbore.

May Increase Prices

Chicago, Nov. 12—The local feeling regarding the Mosler decision is that the settlement of this hard-fought case may have a tendency to increase the price of spark plugs. It is figured out here that Mosler will demand either royalty from other makers or else insist they take out licenses to manufacture under the Canfield patent. This may even force some concerns to quit manufacturing plugs, where the added royalty would increase the price of production so that they cannot compete in the open market with the

larger concerns. It seems to be the general opinion that the Canfield patent covers all spark plugs made in this country and that the industry as a whole will have to bow to the decision.

Still others feel that the decision will not affect prices. They say that 1 cent per plug would be a fair royalty and at that fee there should be no reason for increasing the price.

GERBER BUYS ABBOTT COMPANY

Detroit, Mich., Nov. 10—The Edward F. Gerber Co., Pittsburgh, has purchased outright the Abbott Motor Co. Negotiations leading to this sale have been under way for several days, as reported last week, and the deal was closed at a meeting of the chief stockholders on November 8. The ratification of the sale includes about 90 per cent of the stockholders.

The proceeds of the sale will go to the merchandise creditors of the Abbott company, while according to the present plan F. M. Knapp and his associate stockholders will, by taking up the bank indebtedness, be released from any other indorsement which they have made.

Gerber, former distributor of Michigan cars, and who attempted to secure the Michigan Buggy Co., Kalamazoo, Mich., when this concern failed, intends to continue the making of Abbott cars with the same factory organization and managing officials. The concern will continue to be known as the Abbott Motor Co., and with the sufficient working capital which is promised it should start anew to produce cars on a large scale.

SCHACHT REALTY SOLD FOR \$17,000

Cincinnati, O., Nov. 10—The real estate belonging to the Schacht Automobile Co. was auctioned off this afternoon. E. H. Huenfeld, a tinware man of this city, bought it in for \$17,350. The real value is \$26,000.

Ohio's Registration Law Held to Be Unconstitutional

COLUMBUS, O., Nov. 10—Judge Kinkead in the Franklin county courts declared the new Warnes motor law, enacted at the last session of the Ohio general assembly, unconstitutional. The law fixed the fees for registering motor cars in Ohio upon their horsepower and were graduated from \$5 to \$18.

The Warnes law was to become effective January 1, 1914. It provided that the registration fees, after being used to operate the department, should go, one-third to the road repair fund and the remainder in the general fund.

In his decision Judge Kinkead finds that there will be a surplus of \$1,000,000 after the expenses of the offices are paid, of which but \$333,333 goes into the road fund. The opinion holds that while the ostensible purpose of the law is to police the roads, still it is in a form of a tax for the purpose of furnishing revenue to the state. Thus he holds the law is unconstitutional because it is double taxation, as all motor cars are taxable as personalty.

The court holds that the only way a fund for road improvement and repair can be raised is by a uniform system of taxation which taxes all property the same. Otherwise it is double taxation and is thus in conflict with the supreme law of the commonwealth.

It is believed that the attorney-general will seek to have the decision of the lower court reversed in the supreme court of Ohio, although no statement to that effect has been made by the attorney general's office.

Newkirk in Simplex El Paso-Phoenix Race Winner

Tetzlaff Captures Feature 50-Mile Track Event

PHOENIX, Ariz., Nov. 7—The first annual road race from El Paso to Phoenix was won by Jed Newkirk in a Simplex. He drove the 517 miles in 17 hours 10 minutes, the finish being on Thursday. Johnson in a Stutz was second in 18:39 and Naquin in a Velie third in 19:17. Others to finish were: Clark in a Brena, Durack in a Cadillac, Miller in a Mitchell, Hagerman in a Cadillac and Creech in a Buick.

The purpose of this race was to demonstrate the practicability of the Borderland route for transcontinental travel. The El Paso enthusiasts and those along the route wished to impress the motoring public that this is the only transcontinental route that is open the year round.

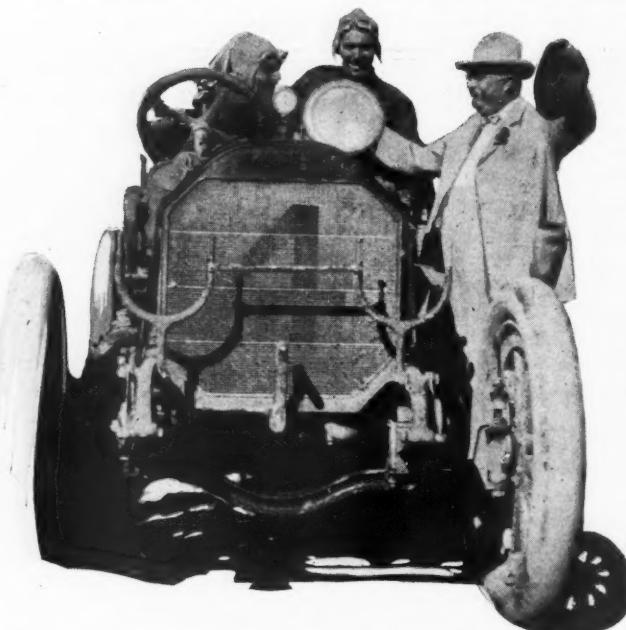
It was a hard-fought race from start to finish and was not won until the last 100 miles had been covered. One hundred miles from the finish it looked like an easy victory for the Cadillac, but after having a lead of over 1 hour Durack went into a hole and broke a radiator petcock. Not discovering his trouble, he drove for mile after mile without water, and the ensuing delay cost him the race.

Newkirk had been driving consistently throughout and went into Bisbee, the first night control, in fifth position. He kept a steady pace, speeding up only in the last 50 miles and won with time to spare. He used Miller tires and did not make a change in the entire race. The Velie was leading at Bisbee, with the Stutz second and the Buick third. The first two finished well up, but the Buick was ditched.

Nineteen cars started and eight finished. Fourteen went into the control at Bisbee. The winner averaged 33.3 miles per hour. It has been rumored that this race will be made an annual affair. It may be preceded next year by a race from Dallas to El Paso.

Thirty thousand people saw the track races here Thursday, the feature being a 50-mile race for a purse of \$2,000. Tetzlaff in a Fiat won, making the half century in 50:53%. Oldfield with his Christie lowered the track record, first to :48% and later to :48 flat.

Tetzlaff in the Fiat Cyclone jumped to the front at the start of the 50-mile run and led to the finish. Magonne in the Stutz held second, with the Mercer third. Oldfield in the Renault had engine trouble and lost many miles. From the jump the time was fast, the first mile from a standing start being made in :58. The second mile was covered in :54. Tetzlaff made



GOVERNOR HUNT OF ARIZONA CONGRATULATES DAVIS, THE WINNER OF THE LOS ANGELES-PHOENIX RACE

the first 5 miles in 4:38 and the 10 in 9:33%. The 15 were left behind in 14:58% and the 20 in 20:00%.

Magonne crept close to Tetzlaff on the twentieth, but Ted let out his Cyclone and opened up the hole to a sixteenth of a mile. The Mercer was lapped in the twenty-second, but held on close for many miles. Tetzlaff's time for 25 miles was 25:07% and the 30 30:18%. Tetzlaff was still leading at 35 miles in 35:25 and held steady to the fortieth in 40:29. The Cyclone reached the 45-mile mark in 45:35 and finished with a lead of 1/2 mile over the Stutz and 1 mile in front of the Mercer. Summary:

15-mile race—Carlson, Simplex, won; Ball, Marmon, second; Ellis, Buick, third; Newkirk, Simplex, fourth. Time, 15:54%.

Mile trials—Oldfield, Christie, :48% and :48. 15 miles, road race entries only—Buxton, Mercer, won; Nikrent, Buick, second; Chnock, Ford, third; time, 16:50.

Free-for-all, 50 miles—Tetzlaff, Fiat Cyclone, won; Magonne, Stutz, second; Nikrent, Mercer, third. Time, 50:53%.

R. F. D. MEN TEST CARS

Bloomington, Ill., Nov. 10—Hard roads for the rural free delivery routes, will create a tremendous demand for motor cars among the carriers. The only thing that prevents the general use of cars for carrying the farmers' mail, is the occasional bad roads following rain. The majority of the carriers cannot afford to own cars and horses at the same time, as the horse is eating while idle and either the horse or the car must be dropped from consideration. As soon as hard roads succeed the present dirt roads every carrier, in all probability will invest in a motor car. An interesting test made among the carriers out of the Bloomington postoffice, attracted much attention.

One-half of the carriers borrowed motor cars and used them to cover their routes. The average distance of each route was 24½ miles. The average time consumed was 1½ hour and the average number of stops for mail, ninety-four. With the familiar horse and cart, the carriers required 7 to 8 hours to cover the route with favorable roads. The difference in time was so great the every carrier became a convert to the motor car.

STARS FOR SAN ANTONIO

San Antonio, Texas, Nov. 8—A strong list of entrants has been obtained for the San Antonio races November 20, 22 and 23. Louis Disbrow, driving his Simplex Zip and Ralph de Palma, with his Mercer, have entered. In addition to the Case team, the racing committee of the San Antonio Automobile Club, which

is arranging the meet, announced that Monckmeier, driving a Staver and Rickenbacker in a Mason, have been secured.

R. C. H. BID NOT BIG ENOUGH

Detroit, Mich., Nov. 11—The public auction sale of the property of the R. C. H. Corp., Detroit, which was held this morning, did not bring forth any bids which were acceptable to the receiver, the Security Trust Co., and in consequence no action relative to the disposition of the business took place. A bid of \$164,000 for the entire assets was made by Harry F. Grant, representing, besides himself, J. F. Hartz, C. P. Seider and Charles F. Beardsley. All of these men are well known in automobile circles in the city. The R. C. H. formally was declared bankrupt on November 6.

ASK BANKRUPTCY FOR AMERICAN

Indianapolis, Ind., Nov. 12—Special telegram—The Columbus Lithographing Co., Columbus, O., the Globe Machinery and Stamping Co., Cleveland, O., and the Gardner-Bryan Co., Cleveland, O., creditors, have filed a petition in the United States court here asking that the American Motors Co. be adjudged bankrupt and that a receiver be appointed. Judge Albert B. Anderson has named Frank E. Smith, vice-president of the company, as receiver, and he has qualified by giving \$35,000 bond. Smith was appointed receiver for the company in the county court recently.

TO TRY NEW CONTEST RULES

New York, Nov. 11—The New York Dealers' Contest Association has scheduled

a 500-mile 3-day reliability run for December 3-5, in which a brand new set of contest rules worked out by the contest committee of the association and approved by the contest board of the American Automobile Association will be used. These rules take into consideration all parts of the car equipment such as windshields, tops, speedometers, tire-carriers, self-starters, electric and gas lighting, and even penalize for tire blowouts, but not for punctures. During the run the contesting cars will be penalized for lateness at controls

and also for all work by way of repair or replacement done on the car or any of its equipment. At the conclusion of the run there will be outdoor tests of motor, clutch, brakes, etc., together with a searching technical inspection of all car parts. The schedule comprises a circuit of Long Island the first day, returning to the New York headquarters at night; on the second day it is through New York and Connecticut, and on the last day along the Hudson. The classification will be by piston displacement.

was revolved by the starter continuously for 6 minutes 21 seconds, 318 revolutions being made. The starter then ceased to turn the engine, the voltage of the battery having fallen from 6.3 to 6.1 during the test. The battery was allowed to rest for 14 minutes and the test was repeated, the starter driving the engine for 58 seconds and giving 156 revolutions. The voltage fell from 6.1 to 5.98. The maximum speed at which the starter turned the engine was 66 revolutions per minute.

"The set of lamps consisted of the following: two parabolic headlights with bulb taking 6.1 amperes together, two side lamps with bulb taking 1.7 amperes together, and one dash and one tail lamp in series taking 0.7 together.

"All the lamps, with a total load of 8.5 amperes, were on throughout the trial—that is, for 66 hours 17 minutes. With the exception of a few car stops of short duration the engine always was stopped. The time stop during which the lights were on was 15 hours 35 minutes. At the end of the road trial, after the starter had been used to run the engine, the side lamps and the dash and tail lamps were lit in the garage for 20 hours. During this test the voltage fell from 6.1 to 5.8. During the road trial trouble was experienced on three occasions with a faulty dash lamp socket which did not make proper contact, but no bulbs were replaced during the trial. The engine did not miss fire throughout the trial except when overheated through loss of water.

"During the trial 260 changes from high to low ratio and 126 changes to a lower gear were made. The total time during which the lower gear was in use was 30 minutes 9 seconds. The electrical mechanism for changing gear ratio from one bevel to the other worked well."

Again Cadillac Wins the Dewar Trophy

American Honored by Royal Automobile Club

ONDON, Eng., Nov. 1—The Dewar trophy again has been awarded to the Cadillac car after trial by the Royal Automobile Club recently. This is the second time in which an American car has won the trophy, the other being awarded to the single-cylinder Cadillac after its famous standardization test several years ago. The present award is the first time in which the trophy has been presented twice to the same make of car.

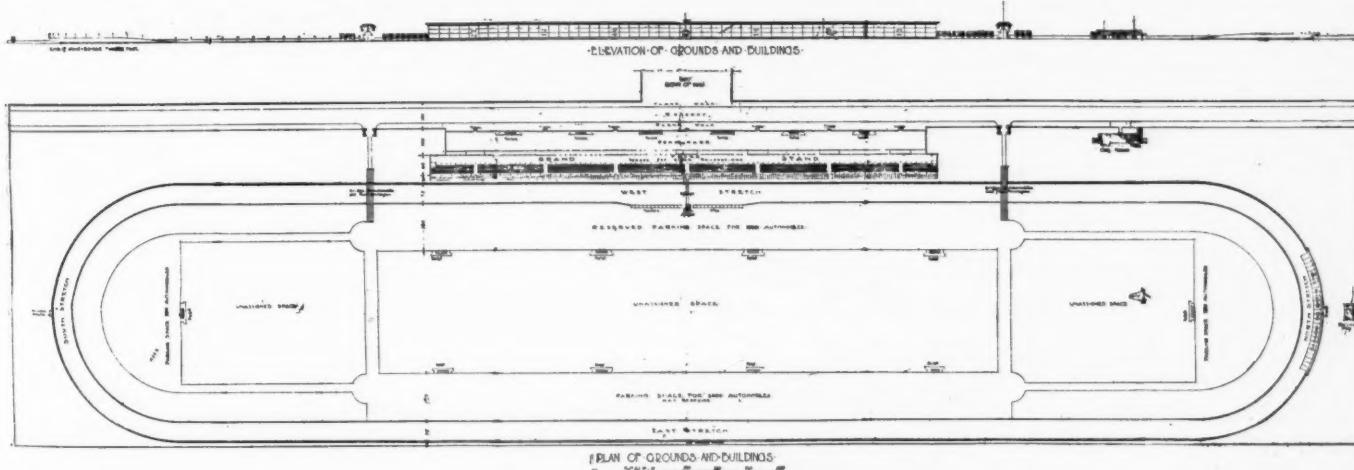
This year's presentation of the trophy followed a 1,000-mile road trial of the 1913 Cadillac by the R. A. C. from September 30 to October 8. The car was entered by the London agent of the Cadillac company and the special points under observation were the combined system of electric starting, lighting and ignition and the two gear ratios provided in the axle, that is, the two-speed direct drive. The report of the Royal Automobile Club follows:

"The trial was held over the six standard routes of the R. A. C., 1,000.4 miles being covered at an average speed for

running time only of 19.5 miles per gallon. The fuel consumption for this distance was at the rate of 17.17 miles per gallon, while 7.4 pints of lubricating oil were used. During the trial there was one stop of 24½ minutes caused by the engine losing all its water by leakage through the circulating pump rear gland, which was loose.

"During the trial the engine was started by the cranker 130 times, the longest interval between stopping and starting of the engine being 37 hours 3 minutes. On the first day the engine failed to start twice. It was found that one cell of the battery was faulty, and subsequent examination showed that a celluloid separator between two of the plates had been omitted. At the end of the day's run the battery was replaced by another. On six occasions the first depression of the pedal actuating the starting mechanism was ineffective, starting taking place on the second depression.

"At the end of the road trial the engine



Seattle's Proposed Speedway Plan

HARRY W. DOHERTY is the leading spirit in the movement to build a speedway at Seattle, Wash. The plans for the track have been accepted and contracts let. It is hoped to have the speedway done in time for a big meet in July, when it is proposed to offer a prize list which will be exceeded only by Indianapolis. The speedway is to be 2 miles in length. The straights will be $\frac{3}{4}$ -mile in length and the turns $\frac{1}{4}$ -mile. The track is designed to sustain a speed of 110 miles an hour. The location of the big oval is 11 miles south of Seattle on the Northern Pacific Railway. The Chicago, Milwaukee and St. Paul, the Oregon-Washington Railway, the Navigation Co., and the Puget Sound Electric Railway connect also, while the track is reached by the Seattle-Tacoma motor road. The grandstand has a capacity of 30,000, while the boxes will hold 4,000 more. There is reserved parking space for 2,500 cars, while 8,000 more cars can be parked in the unreserved space.

Detroit Engineers Listen to Electric Gearshifting Papers

Experts Point Out Features of New Device

DETROIT, Mich., Nov. 10—The regular monthly meeting of the Detroit section of the Society of Automobile Engineers was held on November 6, with electric gearshifting up for consideration. If the interest thus shown by the Detroit engineering fraternity is any criterion, the prediction may be made that the hand gearshifting lever is nearer general abandonment today than was the starting crank 2 years ago.

The four papers of the evening each dealt with a related phase of the subject of electric shifting of the gears and were handled by experts in each line.

Naturally, the talks centered around the Vulcan device, and W. A. McCarrell, chief engineer of the Vulcan Motor Devices Co., opened the series of talks with a general review of the subject and a description of the Vulcan mechanism which was set up in working order.

"The problem which had to be solved," said Mr. McCarrell, "divided itself into several parts. In order to change gears there must be some means of shifting them, some selective mechanism for determining which gear is to be moved, and some method of preventing the shifting of gears when the clutch is in engagement."

When this problem was attacked 6 years ago, there were mechanical, electrical and pneumatic power available. The tendency toward electric lighting and starting finally led these particular investigators to develop their device on the electrical principle, also combining with it a mechanical action.

In a gearset of three or four speeds forward and reverse it is necessary to draw the gears to neutral before any other gear is shifted. In the Vulcan this is done mechanically by what is known as the neutral chain or rocker arm, which is actuated by springs and is connected to the clutch pedal. The gears are drawn into mesh by the electro-magnets, one for each gear. These electro-magnets, encased in cylindrical housings, are placed opposite each other so that one rod serves for two cores and also carries the forks that move the gears.

The whole device is carried in a case which bolts directly to the top or on the side of the gearcase. Illustrations of these two types of installations have been shown in previous issues of Motor Age.

Mr. McCarrell went carefully into the construction of the different parts, how they are protected against the weather, and among other points, how each terminal in the terminal block is of a different size so that if the wires are all disconnected they are sure to be replaced in the right order.

The operation of shifting gears also was shown. If it is desired to start the car from rest, the first-speed button of the selector switch located on the steering column is pressed down. This causes nothing to happen, however, until the clutch pedal is thrown clear down. Then it is that the operations of the device start, for the master switch is closed and through the selector switch the first-speed coil is energized, drawing the gear into mesh.

The clutch is then let in and the car moves in the usual manner. It is possible to slip the clutch in the ordinary way at any time without effecting the shifter, which only comes into play when the pedal is carried its full throw, which is well beyond the point of full clutch disengagement. Now that the first speed has been engaged, the button for the next speed desired may be pressed down, the first button flying back to place since the switch is so made that no two buttons can be down at once. When conditions are right for the change already selected the clutch is thrown down and the shift is made immediately.

The number of operations of the shifter are this time greater than in the shift from neutral to first. This is because the throw of the clutch pedal first brings into play the neutral cam which returns the gears to the neutral position before tripping off the dog which closes the master switch. The whole sequence of

operations, however, seem to take place instantaneously.

Besides the big field the electric system of gear-shifting opens for the increased use of gasoline cars by women, Mr. McCarrell pointed out a second important advantage in that it was impossible to strip the transmission gears in the case of a Vulcan installation. The reason is that the gears are not changed until the clutch pedal is fully depressed and thus the motor torque is sure to be relieved when the shift takes place. The shift is so extremely rapid there is no danger of dropping the clutch back in too quickly.

Probably one of the most important opinions expressed at the meeting was that given by R. W. Griswold, president and general manager of the Vulcan company, in a conversation following the program. Mr. Griswold believes that this non-gear-stripping factor is a powerful argument for a much greater standardization of change-speed sets and he is making every effort to bring about such a standardization in design. Where the transmission specialist now makes four sizes of gears, each guaranteed for only a small range of horsepower, it is plain that, with the stripping bug-a-boo dispelled, he can standardize his product to only two sizes of transmissions which will serve efficiently over the same total range of power as before.

The second paper, under the title of "Electro-Magnets," was read by Charles R. Underhill, of the Acme Wire Co. With the help of off-hand sketches on the blackboard he brought out in a very clear and interesting manner the fundamental principles of the solenoid, the bar electro-magnet, the simple solenoid with its moveable plunger, and the horseshoe electro-magnet.

R. J. Nightingale, of the Willard Storage Battery Co., was to have given the third paper dealing with the "Storage Battery Problems in Electric Gearshifting," but he was unable to attend the meeting. However, W. H. Conant of the Gould Storage Battery Co. covered the subject in a broad way in an extemporaneous talk.

In bringing the formal part of the meeting to a close, Frank N. Nutt, chief engineer of the Haynes Automobile Co., talked on "The Application of the Electric Gearshift from an Automobile Engineer's Standpoint." He first was impressed with the device due to the noiselessness of gear-changing on the demonstrating car the makers had at the 1912 New York show. He had a specially-built outfit put on his own car for the purpose of carrying on experiments as to the best strength of coils, and so forth. The pull of the electro-magnets with the plunger 1 1-16 inch away was increased until 40 pounds was determined upon as being desirable. The question of thick lubricants in cold weather entered into the discussion.

The gearshift mechanism in its final design for the Haynes car was made to take the place of the regular transmission cover, as is shown in the illustrations already referred to. Mr. Nutt believes in the light of his own experience, that the shifter can be adapted to any modern chassis without excessive redesigning or difficulty on the part of the car-maker.

Mr. Nutt replied in relation to a question of battery capacity that the Haynes equipment had been reduced from 80 ampere-hours, to 60 ampere-hours, for 1914, although the electric shifter had been added.

NEW U. S. STOCK ON MARKET

New York, Nov. 7—The United States Rubber Co. is offering to stockholders, both common and preferred, at par, \$9,442,000 8 per cent first preferred stock. Inasmuch as this is equal to 10 per cent of the present outstanding capital stock, each stockholder will be given the privilege of subscribing at par for one share of the new first preferred stock for every ten shares of stock now held. Subscription rights will apply to stockholders of record November 14, and subscriptions will be payable on or before December 15. In connection with the new issue of stock the following statement is made to stockholders:

Recent outlays in enlargements of plants and on the company's plantations in Sumatra and in connection with the expansion of the com-

pany's business, and the desirability of providing therefor without increase of funded debt, have led your directors to offer to stockholders for subscription at par \$9,422,000 of 8 per cent first preferred stock. Under this plan the stockholders will receive the full benefit of the issue without payment or allowance of any commission or other like expense.

For the fiscal year to October 1, 1913, the business of the company, both in volume and profits, has been fully equal to the business for the corresponding period of 1912, the business of which year, both in volume and profits, exceeded that of any year in the history of the company.

It is confidently expected that before long our extensive plantations in Sumatra will provide the company with sufficient crude rubber to meet a substantial part of its requirements at actual cost of production, and that its rapidly expanding development department will lead to important economies in the utilization of the crude material and in manufacturing methods. Moreover, with the outlays being made, the company's plants will be in condition to take care of the increased business which it is believed lower prices for crude rubber will stimulate. To meet these developments through the co-operation of our stockholders by an increase in capital stock seemed to your directors a wise and conservative move at this time.

At the meeting yesterday afternoon the directors elected Nicholas F. Brady a member of the executive committee to succeed his father, the late A. N. Brady.

PREMIER INCREASES ITS CAPITAL

Indianapolis, Ind., Nov. 10—The following statement was issued today by H. O. Smith, president of the Premier Motor Mfg. Co.:

"November 3 the stockholders at the Premier Motor Mfg. Co. at a special meeting called for the purpose authorized a \$500,000 increase in capital stock and a bond issue on \$250,000, thereby providing a substantial increase in working capital. This was made necessary by the rapid increase in the company's business, which more than doubled in 1913 with the bringing out of a moderate-priced six."

COLONEL POPE SOLE RECEIVER

Hartford, Conn., Nov. 10—Although there was considerable opposition to the appointment of Colonel George Pope as the sole temporary receiver of the Pope Mfg. Co. at a hearing held before Judge Joseph P. Tuttle in the superior court last Friday Colonel Pope was confirmed temporary receiver. A hearing on the appointment of a permanent receiver is to be held in the superior court December 5.

The first note of disapproval materialized when C. C. Barton, representing a stockholders' protective committee in Boston comprehending 25,995 shares, said that his clients wanted representation on the board of receivers. Mr. Barton asked that Frank J. Tyler of Boston, connected with the motor industry for years and with the Maxwell company, be appointed additional receiver. Mr. Barton also said the interests he represented objected to the present management of the company, which had been extravagant.

Edward E. Blodgett of Boston, representing holders of over one-half of the

note indebtedness, which in all is about \$800,000, distributed through Massachusetts and New York, stated that his interests did not desire the removal of Colonel George Pope. Their opinion, however, was that to wind up the affairs of the company and derive anything from it there must of necessity be more money borrowed, and naturally from the same people. The banking interests, his clients, wished for the appointment of an additional receiver in Charles A. Morss of Boston, manufacturer, director of the First National Bank of Boston.

GOODYEAR DECLARES DIVIDEND

Akron, O., Nov. 10—The regular cash dividend of 12 per cent on common stock was declared at a meeting of the directors of the Goodyear Tire and Rubber Co. at Akron last week. The annual factory inventory is now complete and manufacturing operations in full force have been resumed for the 1914 run. During the past year Goodyear has added a strong mechanical goods department to its line, which formerly was confined mostly to tires. In motor car tires the Goodyear factory capacity is now 10,000 a day, besides the immense quantity of motor truck tires, carriage tires, motorcycle and bicycle tires that are regu-

larly turned out. Nineteen-thirteen saw the Goodyear output increase from \$26,000,000 to \$33,000,000, despite the handicap of strike and flood. President Seibeling asserts that in spite of all rumors of mergers, etc., that have been going the rounds, Goodyear has had absolutely no negotiation of any kind with any other company.

SLUMP IN GOODRICH STOCKS

New York, Nov. 6—Goodrich preferred stock dropped 5½ points today, with few trades. The drop was from 87 to 81½. No reason for the drop is given.

ALLEN WINS TIRE COVER SUIT

New York City, Nov. 7—A decree has been handed in by Judge Hand in the United States district court for the southern district of New York in favor of the Allen Auto Specialty Co. against the Niagara Auto Cover Co. It will be remembered that in November, 1911, a suit was filed by the complainant alleging certain infringements on a tire cover. Then the complainant discontinued that style of cover and placed on the market a new tire cover, which was the basis of a new suit on March 7, 1912, involving an infringement of another phase of the Nathan

patent, No. 799,662, granted to him on September 19, 1905, and assigned by him to W. A. Allen, who in turn assigned to the Allen Specialty Co. In this last suit the principle involved was the water-shedding feature covered by the patent.

INDIANAPOLIS STRIKE ENDS

Indianapolis, Ind., Nov. 11—Motor cars never were more appreciated than they were during the last 10 days because of a strike of street railway employes, which resulted in a suspension of all street car traffic from October 31 to November 8. The whole working population of the city depended on motor cars to get to and from work. Private owners of machines did a profitable business hauling passengers at from 10 to 25 cents each. The accommodations were insufficient and thousands walked. Business interests of the city are suffering materially as a result of the strike.

FUEL TEST ABANDONED

Philadelphia, Pa., Nov. 7—A number of promised entries failing to materialize, the gasoline economy contest to Wilkes-Barre, Pa., that was to have been conducted today and tomorrow by the Quaker City Motor Club, was necessarily abandoned.

France Picks Lyons Course for Grand Prix July 4

Cars to Be Limited to 275-Inch Capacity

PARIS, Nov. 1—France will hold its annual grand prix in the neighborhood of Lyons on Saturday, July 4, for cars having a cylinder area of not more than 4½ liters—275 cubic inches. All details in connection with this race were settled at a meeting of the racing board yesterday, thus giving manufacturers 8 months in which to prepare for what promises to be one of the finest long-distance road races ever held in France.

Opposed to Free-for-All

The rules under which next year's race should be held have called forth a considerable amount of discussion. The first proposal was to limit the quantity of gasoline and number of tires. Both car and tire manufacturers opposed this. The second scheme had in view the running of two races at once, for cars of 275 cubic inches and for racing machines of any power. Among the new school of racing experts strong opposition was brought against the free-for-all class, it being maintained that this would not only kill the general interest in the smaller racing cars, but that under a free-for-all rule it was impossible for any real progress to be made in motor car design.

At least a dozen firms intimated that if the unlimited class was maintained they would refuse to take part in the race, among these firms being Peugeot and Delage, who would only have had to enter this year's cars under the free rule, while

the adoption of the 4½-liter rule would necessitate much experimental work and the building of a special set of racing cars. The racing board saw the foolishness of maintaining the big class and finally decided to run one class for 275-cubic inch cars only.

Next year's racing cars will be small models. Dimensions permissible under the cylinder allowance are 80 by 222 millimeters, 85 by 198, 90 by 177, and 95 by 156 millimeters. It is practically certain that all the competitors will have four-cylinder motors with a bore varying between 90 and 95 millimeters. A good average size will be 94 by 160 millimeters, or 3.7 by 6.29 inches. It is obvious that they will be high-speed motors, in some cases attaining as high as 3,000 revolutions. Probably 2,800 to 2,900 revolutions will be common.

Mechanical Problems Discussed

The problem of feeding a motor turning at such a high speed will be a difficult one. Pressure-fed charge is being experimented with; other makers are studying a varying profiled cam with a longitudinal movement of the camshaft. Separate carburetors for each cylinder also are being adopted. In the majority of cases valves will be in the head, either inclined, as is done by Hispano-Suiza and Peugeot, or horizontal, as in the Delage racers, but in each case with a hemispheric combustion chamber.

Ignition will be a difficult problem for this high-speed work. Among the solutions will be two magnetos firing simultaneously or two eight-cylinder magnetos running at half speed and firing alternately. It is expected that next year's 275-cubic inch motors will develop 140 horsepower at 2,900 revolutions. Weight will be practically the same as on this year's 3-liter models, namely, 1,800 pounds stripped and 2,800 pounds in full racing trim. A speed of 105 to 110 miles an hour over a level road is looked upon as quite possible of attainment with next year's cars when running in road racing trim.

Lyons Course Selected

When announcing the rules under which the race should be run, it was important from the competitor's standpoint that the course also should be made known. The Lyons district has been selected by the French club because it unites the greatest number of advantages. From a financial standpoint it has the advantage of being near a wealthy city capable and willing to contribute largely towards the expense of fitting the roads for racing. The district has guaranteed to the Automobile club a subvention of \$20,000, of which sum \$12,000 will be paid by the city of Lyons. Altogether it is intended to spend \$30,000 on fitting up the roads for racing purposes, so as to make them absolutely safe for drivers and the public alike.

The course is roughly triangular, the



Camping Outfit Used by Priors on California Motor Tour

California Offers Attractions to Motor Campers

PASADENA, Cal.—Editor Motor Age—With a touring equipment consisting of a Ford roadster, a Danbeard tent and the usual camping supplies, we set forth to learn all that we could of this wonderful state,—her resources, topography and roads. An extension was built on the back of our car having a khaki cover. Here we carried our camp supplies and bedding and it also afforded a comfortable bed for the junior member of our party during the day. Much of the road now is in excellent condition, and the interesting points to be visited on the historic El Camino Real, make touring delightful.

California plans to have completed, in time for the 1915 exposition, a magnificent highway traversing the coast line from San Francisco to San Diego, enabling visitors from the east, who may bring motor cars with them, to visit either exposition and to travel over a paved highway between the mountains and the sea. The program adopted by California for a public highway system is one of the most excellent and most elaborate ever undertaken by any state.

For a large portion of the roads, a pavement has been adopted consisting of a Portland cement concrete base of a minimum thickness of 4 inches and 15 feet wide. The concrete base is covered with a thin coating of asphaltic oil of special quality and stone screening, forming a carpet of $\frac{3}{8}$ to $\frac{1}{2}$ inch in thickness to protect the concrete.

In San Diego the exposition buildings are beginning to assume shape. The site of the exposition could not have been more happily chosen. Balboa park, a magnificent 1,500-acre tract, lies on a high table land in the heart of the city. The western gate of the site is about 15 minutes walk from the business center. From any portion of the exposition grounds, the visitor enjoys a splendid view of city and harbor.

A visit to San Diego is incomplete without visiting Tia Juana, just across the border into Mexico. You will know the moment the boundary line is crossed that you are in a country so busy with revolutions that there is no time or money for road building. The coast road from San Diego north is in fine condition. Good paved roads are being built all along the way and the only inconvenience the motorist suffers is from closed roads where permanent roads are being built and a temporary road made necessary.

The inland route, while not so good as the coast route, traverses an interesting country. Here we saw many acres of lima beans, olive groves and all kinds of fruit. From Riverside to Corona we followed beautiful Magnolia drive, a paved road bordered with palms and magnolia trees. Arriving in Corona a few days before the road race, we camped on the outskirts of the town in order to see the preliminary work.

From Los Angeles, through the San Fernando valley, we followed a double boulevard of asphalt, bordered with flowers and foliage. Arriving at Casitas pass just at night fall, we camped in Foster's Memorial park, a beautiful natural park at the entrance to the pass. Here were tables, seats, running water and plenty of wood for the convenience of picnickers and campers.

We crossed the Casitas early in the morning, finding it a rough and rather dangerous road. The magnificent view obtained from the mountain tops, however, repays one for the long climb.

From Santa Barbara, the road follows the coast line until Gaviota pass is reached. Here we found an excellent camping place, a wild and beautiful spot in the mountains. From here road conditions are bad. Heavy loads of grain were being hauled to market, cutting the roads and making them rough and dusty. With the expectation of having permanent roads soon, work had been abandoned on the roads by the people in the community.

From Salinas to San Francisco you will travel through a beautiful country and over excellent roads.

Work on the exposition in San Francisco is progressing very fast. The two expositions in California will in no way interfere with each other. The scope and character of each is outlined and is dissimilar. The ideal way will be to attend both expositions and to motor over the state road connecting the two cities. Weather conditions need not be taken into consideration, and summer or winter, the trip will prove interesting and delightful.—Grace Lane Prior.

legs measuring about 4.6, 7.7 and 11 miles. The exact distance round is 23.3 miles, and as twenty laps have to be covered the total will be 466 miles. The first leg, starting from Les Sept Chemins, 12 miles from Lyons, is short and of a fairly easy nature. It is a national highway at present in a moderate condition, but will be resurfaced entirely for the grand prix.

To reach the second leg of the course the village of Givors has to be passed through in its entirety. This comprises a passage under the railway, 300 yards of paved road, and a right-angle turn in the heart of the village, the cars running from a paved to a macadam road. It is intended to relay the whole of this paved portion in order to secure a perfectly smooth surface. The second leg runs along the hillside overlooking the river Gier and is known as "the road of the hundred bends." The hills are only short, but the winding nature of the road will put the drivers and their steering gear to a severe test.

At the end of this leg there is a pronounced hairpin turn followed immediately by a 2-mile winding hill of a difficult nature. The rest of the leg is a dead straightaway of a switchback nature, on which it will be possible to attain speeds of more than 100 miles an hour. It is towards the end of this stretch, and not far from the hairpin turn into the first leg, that the grand stands will be erected. After the grand stands there is a short, winding descent to the hairpin and the first leg of the course. The course will necessitate the use of a car having a particularly lively getaway, while the four or five-speed gear-set will have to be very carefully worked out after a critical examination of every portion of the road.

Although entry blanks have not yet been issued, it is announced that five-car teams will be admitted and the entry fee will be \$600 per car. There are promises of a big number of starters.

France's 1914 Program

Next year's racing and competition program in France is a heavy one. It is frankly admitted by the entire trade that although the industry may be in a flourishing condition, public demonstrations are of vital importance in order to further technical development and maintain a national interest in the motor movement. Hence there is not a branch of the industry, from cyclecars to motor trucks and motor plows, for which some competition or demonstration has not been provided. Most important of all, these demonstrations are assured the full support of the trade.

The outstanding event of the year is the French grand prix to be held near Lyons on July 4. The announcement of this race under a $4\frac{1}{2}$ -liter rule has aroused a feeling of enthusiasm. The fact that the race will be one of the most keenly contested speed contests in the world is not its most important feature. Held down to

275 cubic inches, manufacturers taking part in this race will have to study the problem of motor efficiency in its closest details, and the work done in the laboratories and the practical results obtained on the road will have an immense influence on the 1915 models. Eight months have been given in which to prepare for this race, and it is a well-known fact in the trade that a number of factories already have set their research and racing departments to work on this particular problem.

The season will open with a cyclecar and light-car endurance test around France during the month of February. This event is timely, for it will draw the attention of the public to a popular type of motor car for which there is likely to be an immense demand in the near future. Regularity of running and economy in lubricating oil and gasoline will be the features calling for special attention. During March there will be another reliability and endurance test, of about 4,000 or 5,000 miles round France, this time for medium-priced full-sized touring cars. This event is now a classic. While it is not of primary importance as a test of cars, it is valuable in stirring up interest throughout the country and is recognized by dealers as a help to trade.

Le Mans to Have Race

As an aftermath to the French grand prix there will be a long-distance road race at Le Mans, probably about September. This will unite nearly all the cars having run in the national speed contest. The Coupe de l'Auto race is of particular importance by reason of the reduction of the cylinder area from 3 to 2½ liters. In making the change it is claimed that all possible lessons have been learned from the 3-liter rules, and in order to secure further development it is necessary to still further limit the size of motors. This race will be run, in all probability, at Boulogne, towards the end of the summer.

Outstanding hill-climbs will be Gaillon and Mont Ventoux; this class of competition is now of far less importance than long-distance road races. Monaco motor boat races, to be held in April, have a close connection with the motor industry, for motor boating in France only exists as a means of testing out motors which will later do service on the road.

In the commercial field the event of the year will be the military trials, extending over a month and designed to prove what types of vehicles are suitable for army subsidies. This year special attention will be given to four-wheel drive tractors, which it is intended to adopt for general military haulage and as a substitute for horses in the handling of heavy artillery. In addition to these trials there will be a special military competition for four-wheel drive tractors only early in the year. A show in 1914 is already announced. In all probability it will be held during the month of October.



Imperial High Line Canal Which Has No Bridge Where Trail Crosses

Texan Tries Out Borderland and Midland Trails

MIDLAND, Tex.—Editor Motor Age—The recent pathfinding trips of W. O. L. Westegard and E. L. Ferguson over the Borderland and All Southern highways and over the Central route through Colorado, Utah, and Nevada have aroused very great interest and enthusiasm among the people along these routes as well as among the tourists who are anxious for the development of better through routes.

While many experienced drivers have been over both routes, a comparatively small proportion of the average motor driving public has driven over them for the entire distance, many people shipping their cars over the worst places. The recent trip of a Midland, Tex., owner, J. M. Jemison, over the worst of both of these routes for over 6,000 miles in a small Detroiter with practically no breakdowns and no rail shipments of his car, therefore is worthy of note.

Mr. Jemison left Midland, Tex., July 9 in a five-passenger Detroiter carrying four grown persons and a complete camping outfit, a total load of 1,150 pounds. They struck the Borderland route at Roswell and followed it the entire distance to San Francisco. They found very rough roads almost the entire distance to Brawley, Cal., but made an average run per day of 150 miles.

The worst part of the road by far was found in the Mammoth Wash in the Imperial valley, and they went through it with some difficulty. By letting out some of the air in the tires they made the 18 miles in 3 hours with no assistance, but on getting through it, found the Imperial high line canal to have no bridge across it, and they had to take a run at it and trust to their momentum to carry them after the carburetor and magneto got wet. They made the crossing successfully. A bridge is badly needed at that point as the nearest habitation is 20 miles away.

The remainder of the trip up to Frisco is over splendid roads excepting in a few places where road work was going on. They arrived in San Francisco with a total damage of one broken spring and one blowout and traveled 2,500 miles in 14 days running time with a gasoline consumption of 1 gallon to 18½ miles.

On returning to Midland Mr. Jemison left San Francisco September 4 with two passengers in the car and came east by way of Lake Tahoe, Carson City, Reno, and across the desert to Ely, thence to Salt Lake City, and thence over the Overland trail through Laramie to Denver. Mr. Jemison stated that the Midland trail was considered impassable at that time on account of the many washouts he found extremely rough roads as it was, and in Wyoming he encountered many heavy snows which lasted all the way to Raton, N. M., where the snow changed to heavy rain and extremely muddy roads, which he successfully negotiated and arrived in Midland, Tex., after covering a total of 6,000 miles with a total damage of three broken springs and five worn-out tires. The highest elevation he encountered was 12,500 feet above sea level near Cloudcroft, N. M., and on the return trip about 9,600 feet near Lake Tahoe.

In commenting on the two routes Mr. Jemison said that the Borderland route has considerably the best of it both in present condition and in the amount of money it will take to put a route in the proper condition for regular motor travel. There is magnificent scenery on both routes, and also much tiring monotonous travel on both, but the trip is well worth the time and expense, which for that matter is much lower than it would cost to see the country in any other manner in a reasonable time, and it can be made by any good car with a careful driver.

An important step in the good roads movement in west Texas was taken here when the Midland Automobile Association was formed. Fifty owners signed up a year's contract for the maintenance of the motor roads in this district. Such an organization has been discussed for some time, but its final crystallization into definite form was largely due to the vigorous efforts of W. B. Elkin and Dr. W. W. Lynch, ably aided by the recent heavy rains.

A peculiar condition, common to most of the plains country, exists here, and that is that the majority of the motor traffic is over special roads through the great pastures and which are used only for motor cars. They are therefore private roads but are used by the entire motor traveling public and their maintenance must fall on individuals or such an association as has been formed.—E. A. Graham.



The Readers' Clearing House



WIRING FOR SINGLE COIL IGNITION

Requires the Use of a Timer and Distributor—Magneto Not Changed

ST. LOUIS, MO.—Editor Motor Age—I have a 1909 four-cylinder Cadillac. How can I wire this with a single-unit coil and show by illustration how it is accomplished?

2—Explain how an S. R. O. ball bearing is put together. Also how steel balls are made.—A. A. Percival.

1—The 1909 Cadillac touring car employed four unit coils, a battery, commutator and high-tension magneto. The installation of a timer is necessary for converting this system into one employing a single coil for the battery circuit. As shown in Fig. 1, one battery wire is attached to the timer and the other end to a double throw switch which connects the battery with the low-tension winding of the coil. The high-tension lead is attached to the distributor and the distributor wires are sent to one set of spark plugs. The magneto ground wire is run to the switch and the other end of the switch grounded as shown. If the timer is not used then there will be a waste of current as the battery will be in use continually while the switch is on battery side. With the timer, current is taken only at intervals and just when it is needed for the coil.

2—This information is not obtainable from the S. R. O. factory.

INTERESTING CAR INFORMATION

Gear Ratios, Speeds and Weights Given
Illinois Reader

Cambria, Ill.—Editor Motor Age—What is the gear ratio and weight of the 1914 Partin-Palmer 38?

2—What speed will the Partin-Palmer make on the third speed?

3—What is the bore and stroke to the 38 engine of the Palmer?

4—What is the gear ratio of the 1912 Roadster, Maxwell, and what speed will it make?—L. H. Green.

1—The Partin-Palmer 38 weighs 2,500 pounds with equipment and is stock equipped with gears giving a 3.7 to 1 ratio.

2—It is claimed that the car can travel 52 miles per hour on high and 30 miles per hour on second speed.

3—The maker will not give these dimensions for the reason that the motor is said to develop a high horsepower for its displacement and hence the issuance of dimension figures would tend to convey a wrong idea of the motor's power.

4—The Maxwell has a gear ratio of 3.50 to 1 and is capable of attaining a speed of over 40 miles per hour.

Sunbeam Makes Twelve-Cylinder Car

Coventry, England—Editor Motor Age—I see in Motor Age which reached me today an answer to a correspondent in which it is stated that the largest number of

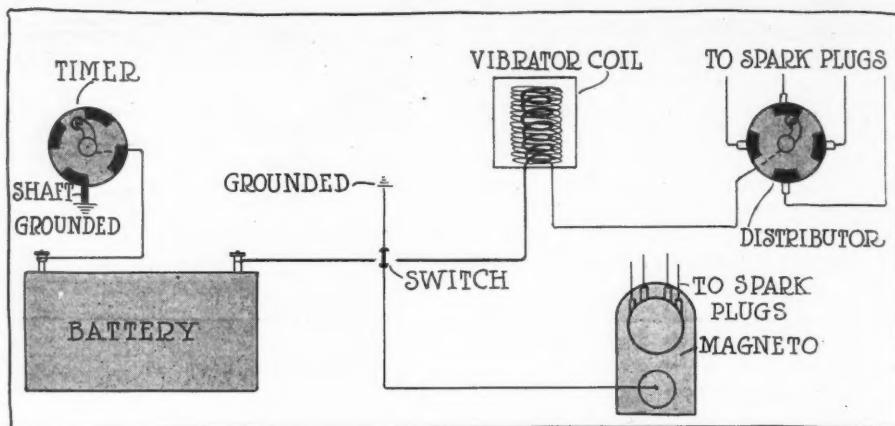


FIG. 1—WIRING DIAGRAM OF MOTOR WITH SINGLE UNIT COIL

Both a timer and a distributor must be used in the battery circuit as the use of the magneto distributor would require magneto reconstruction

cylinders that have been applied to a motor car is eight. It may interest you to know that we have had a twelve-cylinder racing Sunbeam on the track here being tried out for some months.—Henry Sturmey.

TO REBUILD A SAMSON TOURING

Wrecked Car May Be Made Underslung—
To Use Old Motor

Towanda, Pa.—Editor Motor Age—I have a Sampson 35 touring car which was slightly damaged by another machine running into it and would like to make a light speedster out of it. As I have to buy a new frame, could I get an underslung? And how, where?

2—Could I use the same springs?

3—I want to change the gear ratio, which is now 4 to 1, to 3 to 1. What could be suggested?

4—Where could I get a bucket-seat body or racing body?

5—There is a low-tension magneto on the motor now, could I put on a Bosch? What style would be recommended for speed?

6—I want to build a good speedy car and use the same motor, transmission, rear axle and wheels. I must get a new front axle, radiator and frame, all the rest is in good condition.—S. Devlin.

1—An underslung frame could be used. It would be best to take the matter up with a concern manufacturing frames, for no doubt a special type would be required. The following companies market frames, Detroit Pressed Steel Co., Detroit, Mich.; Hydraulic Pressed Steel Co., Cleveland, O.; Parish Mfg. Co., Reading, Pa.; A. O. Smith Co., Milwaukee, Wis.

2—If you used the underslung type of

frame the old springs could not be used.

3—To change the gear ratio the driving pinion or differential gear must be changed. One could use a large pinion or a smaller differential gear, but the best way is to buy the gears in sets for then ill fitting is not likely to occur.

4—Any body maker will supply such a body.

5—A Bosch could be installed. Motor Age suggests that the double-distributor type be used as this is used largely for motors of the racing type.

FIRE WITH SWITCH TURNED OFF

Cold Motor Has Short Circuit in Switch—
Wires May Be Crossed

Mason City, Ia.—Editor Motor Age—Why is it that in the Ford motors the connecting rods have from 1-32 to 1-16-inch side play on the bearing end?

2—I have had some trouble with the Chalmers 36, 1913 model. It seems at times when you throw off the switch to stop the motor, it may keep on running, not only when the motor is hot, but when it is not. I have looked over the wiring and switch, magneto, and everything seems to be alright and I am sure it is not carbon.—W. E. Hubonhour.

1—Because the rod is held rigid at the top end and if it were fastened tightly at both ends there would be a tendency to create piston slaps. The play at the lower end is very slight.

2—With the motor cold, the probability is that there is something wrong with the switch, as a cold motor would require a spark for the ignition of the gas. One can tell whether it is the switch or the wiring by having someone turn the switch to the off position after the motor has been run a minute or so and then hold your hand on one of the spark plugs. If a shock is felt it is an indication that the switch is permitting current to flow. Examine the switch carefully and all the wiring of the motor. See that the insulation is not broken and that the high-tension wires are well insulated from the rest. With a perfect switch in off posi-

Questions Answered and Communications Received

A. A. Percival.....	St. Louis, Mo.
L. H. Green.....	Cambria, Ill.
Henry Sturmey.....	Coventry, England
S. Devlin.....	Towanda, Pa.
W. E. Hubonhour.....	Mason City, Ia.
H. A. Bauer.....	Zell, S. D.
J. W. Dunbar.....	Castle Rock, Wash.
F. J. Kilmer.....	Oconto Falls, Wis.
A. Reader.....	Milwaukee, Wis.
H. L. Leach.....	Joliet, Ill.
A. C. Johnson.....	Keilher, Minn.

No communication not signed by the reader's full name and address will be answered.

tion there is no spark being sent to the plugs, and hence any firing will be the result of ignition due to carbon incandescence.

FORCE OPPOSES MOTOR'S EFFORT

Ford Brake Bands or Reverse Tight or Vibrators Stick

Zell, S. D.—Editor Motor Age—I have a 1912 model T Ford touring car which has been working nicely up to about three weeks ago. When driving, the car suddenly holds back as though the brakes were applied, and even more so, when the engine seems to hit and misfire, or sort of spits, then one or two explosions follow, after which the car takes hold with good power. These explosions do not always occur, as sometimes it only holds back for a few feet or so. I have had it looked over by different mechanics who have been unable to locate the difficulty. Can Motor Age explain the cause and suggest a remedy?—H. A. Bauer.

The trouble of which you speak is caused often by the vibrators of the coils sticking, due usually to dirt. Clean the vibrators well and see that the motor fires on four cylinders. A tight reverse band or a tight brake adjustment may cause the car to hold back as you say. Motor Age suggests that you loosen these bands slightly and clean and adjust the vibrators.

FUEL INJECTION IN DIESEL ENGINE

Oil Forced Into Cylinder by High Air Pressure—Valve Operation

Castle Rock, Wash.—Editor Motor Age—Why is it that in a two-cycle engine the incoming charge is not ignited when it comes in contact with the outgoing one?

2—What makes a motor misfire when it is overloaded?

3—Explain how the fuel is injected into the cylinder of the Diesel engine.—J. W. Dunbar.

1—The incoming gas does not come in contact with the exhaust gas. The incoming gas is deflected upward and away from the outgoing gas by a baffle plate on top of the piston.

2—Overloading a motor is equivalent to opening the throttle very wide suddenly in which case too much fuel is fed to the motor for its speed and hence the excess fuel remains in the cylinder in a burning condition and ignites any incoming mixture ahead of time.

3—The general arrangement of the valves and fuel injection apparatus of the Diesel motor, as illustrated in Edward Butler's book on "Carbureters, Vaporizers and Distributing Valves," is shown in Fig. 2. The cylinder C has very little clearance between the top of the piston F and the bottom of the combustion chamber B at the end of the compression stroke, at which moment the injection valve operated by the lever J will be opened, to permit the injection of a charge of fuel forced during about 20 degrees of the crank revolution from the supply pipe P assisted by an atomizing charge of super-compressed air through the pipe D. The cage containing the injection valve is water-jacketed, water entering and leaving by pipes W. The operation of the air admission valve A and the exhaust valve E is mechanically controlled in a conventional manner. The movement of the fuel-admission valve is very slight, giving a narrow annular open-

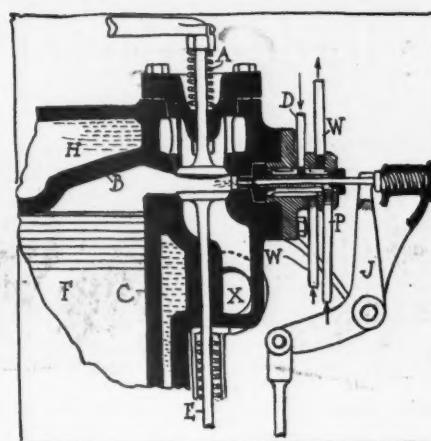


FIG. 2—SECTION OF THE DIESEL ENGINE
The oil is forced into the cylinder by air pressure

ing for the entry of the oil. Surrounding the valve-spindle are a series of brass washers perforated parallel to the spindle by numerous small holes. The oil is pumped into the space around the valve-spindle near its middle, and by capillary action finds its way between the washers and into the perforations. The air for fuel injection is admitted behind the oil; and because of its high pressure, blows the oil into the cylinder when the valve opens. The amount of oil admitted is regulated by the governor, which controls the time of opening of a by-pass connecting the discharge and suction sides of the oil pump. At light loads the oil is pumped to the fuel valve for part only of the admission period, and air alone will enter past the valve for the remainder of the period.

DATA CONCERNING THE HUDSON 20

Maker of the Motor Used—Cylinder Dimensions

Kellher, Minn.—Editor Motor Age—What company made the motor used in the 1910 Hudson 20?

2—What are the actual horsepower, bore and stroke measurements of the 1910 Hudson 20?

3—What company makes the motor used in the 1914 Hudson six?—A. C. Johnson.

1—Most of the 1910 Hudsons were equipped with Continental motors. A few were shipped with motors of another make.

2—The motor had a bore of $3\frac{3}{4}$ inches and a stroke of $4\frac{1}{2}$ inches and developed 22.5 horsepower, according to the S. A. E. formula.

3—The motor used on the 1914 Hudson is a Continental, manufactured by the Continental Motor Mfg. Co., Detroit, Mich.

1910 Mitchell Line Described

Oconto Falls, Wis.—Editor Motor Age—Describe the 1910 Mitchell which I believe they called the model K.

2—Did the transmission in this car hold up well?

3—Why would it not make a good delivery car?—F. J. Kilmer.

1—Mitchell cars for 1910 appeared in three chassis styles known respectively as the models R, S, and T, the first being a runabout and the other two touring cars. The models R and S were practically the

same except as regards wheelbase. The R had a wheelbase of 100 inches and the S, 112 inches. The motor was the same, being of four cylinders with a bore of $4\frac{1}{4}$ and a stroke of 5 inches. The cylinders were of L-head construction, cast in pairs, with the valves in the side and head. Double ignition and Holley carburetor were fitted. Fuel feed was by gravity and lubrication by mechanical oiler. The drive from the motor was through a cone clutch to a three-speed selective gearset located amidships, and thence through shaft surrounded by a torsion tube to a floating rear axle.

The model T was known as the Mitchell six and appeared in seven-passenger touring car form. The six-cylinders had a bore and stroke of $4\frac{1}{4}$ by 5 inches and in point of design the car was the same as the R and S just described. The wheelbase was 130 inches and the rear spring suspension platform instead of three-fourths elliptic as in the R and S.

2—As far as Motor Age knows both the gearset and differential gave good service.

3—Such a vehicle would be just the thing for transformation into a light delivery car.

RADIATOR ANTI-FREEZE MIXTURES

Many Formulas Given for Solutions—Camphor in the Fuel

Milwaukee, Wis.—Editor Motor Age—What are the correct proportions of alcohol, glycerine, water for use in the radiator of a 25 h. p. four-cylinder touring car during the winter months to prevent freezing?

2—Some time ago I saw a statement in one of the issues of the Motor Age relative to the use of gum camphor dissolved in the gasoline. Kindly tell me whether the use of camphor is in any way harmful to any of the parts of the machinery with which it may come in contact or any of the accessories of the motor? Will camphor in any way be detrimental to the proper working functions of the carburetor or the valves of the engine due to carbon deposit?—A Reader.

Joliet, Ill.—Editor Motor Age—Give the formula for mixing denatured alcohol and water for making anti-freeze for winter use.—H. L. Leach.

1—The mixtures given below are safe for stationary engines or motor cars, and are not expensive. Either denatured alcohol or wood alcohol may be used with commercial glycerine. The preparations given will make five gallons of solution.

Will not freeze at 15 degrees above zero:

Water	4 gallons
Alcohol	$\frac{1}{2}$ gallon
Glycerine	$\frac{1}{2}$ gallon

Will not freeze at 8 degrees above zero:

Water	$3\frac{1}{2}$ gallons
Alcohol	5 pints
Glycerine	5 pints

Will not freeze at 10 degrees below zero:

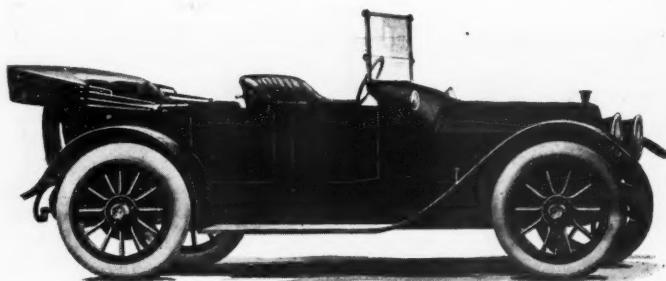
Water	3 gallons 1 pint
Alcohol	1 gallon 1 quart
Glycerine	2 quarts 1 pint

Will not freeze at 20 degrees below zero:

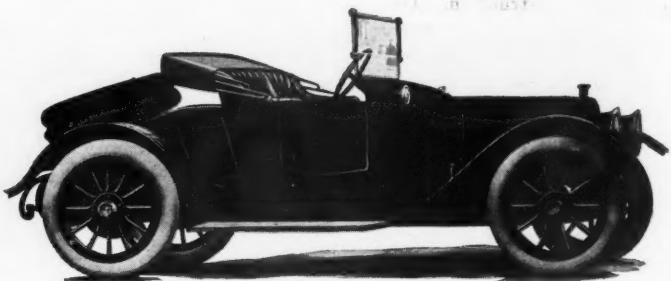
Water	1 gallon 1 quart
Alcohol	2 gallons 2 quarts
Glycerine	1 gallon 1 quart

2—The use of camphor to increase the vaporization of gasoline has been experimented with in England and those who have tried it report such varying results that no definite statement may be given as to its advantage. It has been stated that the use of camphor is not injurious to the carburetor.

Velie Adds Six-Cylinder Model to Its 1914 Line



VELIE MODEL 9 TORPEDO FOR 1914. NOTE SHAPE OF COWL AND WIDTH OF DOORS



VELIE SIX-CYLINDER ROADSTER SHOWING REAR DOOR IN DECK FOR LUGGAGE

VELIE products for the 1914 season are marked by their entry into the six-cylinder field, although the four-cylinder cars, which heretofore have formed the regular output of the Velie company, will be the leaders. The line for the coming season embraces two four-cylinder models and a six-cylinder. The two former are developments of the 1913 chassis. One of these is called the model 5 and is a development from the 4-32 of the present season, and the other, model 9, which is a development of the 4-40. The six-cylinder model is known as the 6-50 and is now throughout. A few sixes have been produced by the Velie factory in the past but not as stock product.

Fours Are Larger

The change in nomenclature of the four-cylinder models is due to the increase in power obtained by slightly increased cylinder dimensions. Model 5 has cylinders 4 by 5½ inches in size, which is an increase of ¼ inch in the bore, the stroke remaining the same. Model 9 is 4½ by 5¼ inches bore and stroke, which is ½ inch increase on the bore over the 4-40 of 1913. The six-cylinder is a Continental engine 3¾ inches bore and 5¾ inches stroke and is the only engine not purely a Velie product.

Prices for 1914 remain practically the same as formerly for the four-cylinder cars. Model 5 appears only as a five-passenger touring car of 113-inch wheelbase and 34 by 4-inch tires at \$1,500. The 4-45 and the six-cylinder car have interchangeable bodies, that is the same bodies may be applied to both chassis, the 5 inches difference in wheelbase being due to the added length of hood of the six. These bodies are five-passenger touring car, four-passenger torpedo and a two-passenger roadster, listed at \$2,000 on the four-cylinder chassis and \$2,350 on the six. The larger four-cylinder chassis is 121 inches between wheel centers and has tires 36 by 4 inches in size. The six has 126-inch wheelbase and 37 by 4½-inch tires.

The three chassis are characterized by certain features of design which are common to all of them. This includes the L-head motor, Bosch dual ignition, Stromberg carburetor, Gray & Davis electric

FEATURES OF 1914 VELIE CARS

Line has three chassis models

Two fours and a six

Six-cylinder Velie is new

Four-cylinder cars are model 9 and model 5

Smaller four has cylinders 4 by 5½ inches, which is ¼ inch greater bore than the 32 of 1913

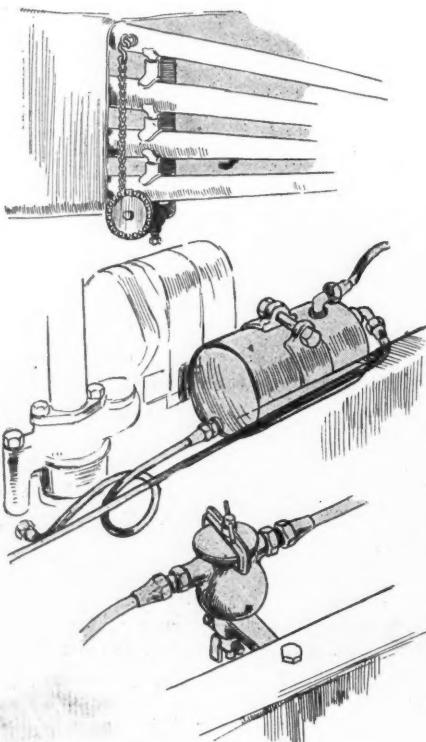
Smaller four has cylinders 4 by 5½ inches, which is ½ inch greater bore than the 40 of 1913

Silent chain driven timing gears

Magneto and pump on transverse shaft driven by worm gear

Carburetor of model 9 on side opposite valves

Great accessibility of magneto, pump and carburetor



SOME 1914 VELIE FEATURES

Above, new type of top holder

Middle, auxiliary fuel tank on 4-35

Below, fuel strainer in gasoline line

system, dry disk clutch, floating rear axle, three-fourths elliptic underslung rear springs, left drive and center control, and a European cast to the bodies.

Among the constructional changes on the two four-cylinder chassis the chief one on model 5 is the extension of the Gray & Davis cranking and lighting equipment to be included as stock equipment on all three models instead of only on the larger four, as obtained during the early part of the closing season. This has necessitated some changes in the arrangement of the motor appurtenances to properly locate the electrical apparatus. Also in the smaller four the fuel system has been altered slightly by the addition of a small ½-gallon auxiliary gasoline tank under the hood. Gasoline from the main supply tank under the seat feeds to this small tank and thence to the carburetor to give a more certain fuel supply on hills. This arrangement has been necessitated by the lower position of the main tank due to the greater depth of upholstery.

Changes on Larger Four

Changes on the larger four, model 9, include the removal of the fuel tank from its former position under the front seat to the rear axle and the installation in the gasoline line of a special fuel strainer under the hood, which may be quickly cleaned. This is rather novel as stock equipment and will be appreciated by most owners. The water pump is located in the new motor on the end of the transverse shaft which also drives the magneto. Formerly the pump was back along the side of the motor and driven by a longitudinal shaft. The new location on the valve side permits cold water to be forced into the motor first around the valve. In the 1913 engine the Gray & Davis cranking motor drove through the flywheel. In the new engine the starter drive is through spur gears to a longitudinal shaft that runs to the front end of the engine and thence by silent chain to the crankshaft. The drive includes a silent overrunning clutch so that the starter motor ceases running as the engine accelerates.

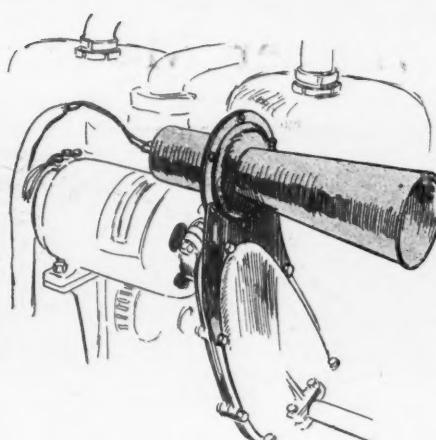
Model 9 is the one typical of Velie design and incorporates most of the Velie

features. The motor itself is an L-head design with the cylinders cast in pairs and incorporates two somewhat unusual points of construction. One of those is the chain timing drive and the other the worm-driven cross shaft at the forward end of the motor which operates the magneto and water pump. Another unusual construction is the arrangement of the carburetor and intake manifold. The former is mounted upon the right side of the motor while the valves are upon the left side and is placed very high so that its float chamber is about level with the top of the cylinder. The intake pipe passes over the cylinders to the intake valves on the other side of the engine. This makes the carburetor very accessible. The hot air intake pipe from the exhaust manifold to the carburetor passes around the rear end of the motor. Another instance of great accessibility is the location of the magneto and water pump. As stated above, these are on either end of a transverse shaft at the front end of the motor and the magneto faces outward, being mounted upon the timing chain housing. The worm drive to this transverse shaft is oiled by a lead from the lubrication system, which latter is of the circulating splash type with individual oil leads to each connecting rod pocket.

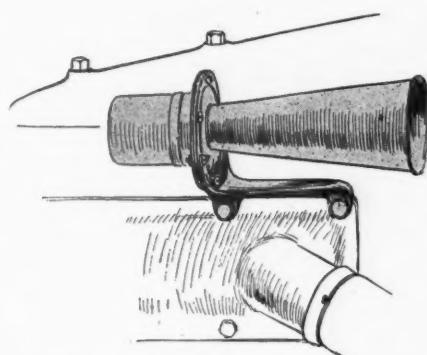
One of the special features of Velie motor construction is the method of attaching intake manifold and water header connections. This consists of a special screwed coupling instead of the usual bolts and studs and comprises a split wedge ring which seats against the flared end of the manifold and is held in place by threaded gasket which screws down to the cylinder casting. This arrangement makes a gas-tight joint which is self-seating, also the connections are interchangeable throughout the motor.

Cranking and Lighting

The generator portion of the three-unit electric system is mounted upon the forward end of the cranking motor and above the motor and drives by a silent chain from the longitudinal shaft running from cranking motor to engine crankshaft. This chain is housed and runs in oil splashed



MOUNTING OF HORN ON MODEL 9



HORN MOUNTED ON MODEL 5 MOTOR

up from the crankcase, to which it is open. The generator is driven at a speed reduction of $2\frac{1}{2}$ to 1. The cranking battery employed is an LBA 80 by 120 ampere-hour battery located under the front seat. Ignition is by a Bosch magneto and in its driving shaft there is an adjustable coupling by which the timing may be altered without disturbing the gearing.

A dry plate clutch located in the flywheel transmits power through a short shaft to the four-speed gearset close behind the motor. This has direct drive on third speed with a gear ratio of 3 13-14 to

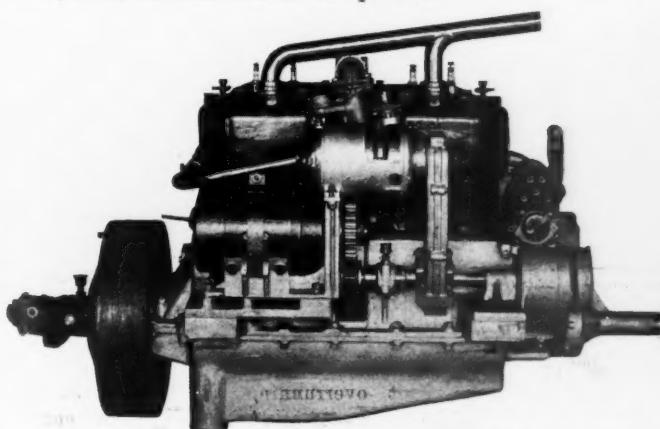
1 on direct and 3 to 1 on fourth. All gearset shafts are carried on large ball bearings.

Motor and gearset are mounted on a sub-frame which is of channel section and filled with ash. A propeller shaft carrying Spicer double universals transmits the power from gearset to the Timken floating axle. These axles have the new adjustable cam plate for the internal brake, thus giving two adjustments, one at the differential on the cross rod and one inside of the drum. Service brakes are external and emergency are internal. Rear springs are three-fourths elliptic and the cars are propelled through them. The axle torque is taken by a large trussed torque arm with ball connections carried in spring cups at the front and giving a universal action. Steering gear is of the worm and sector type with 18-inch steering wheel and in the center is the horn button. The horn in this model is mounted upon the electric generator drive chain housing.

Details of Velie Six

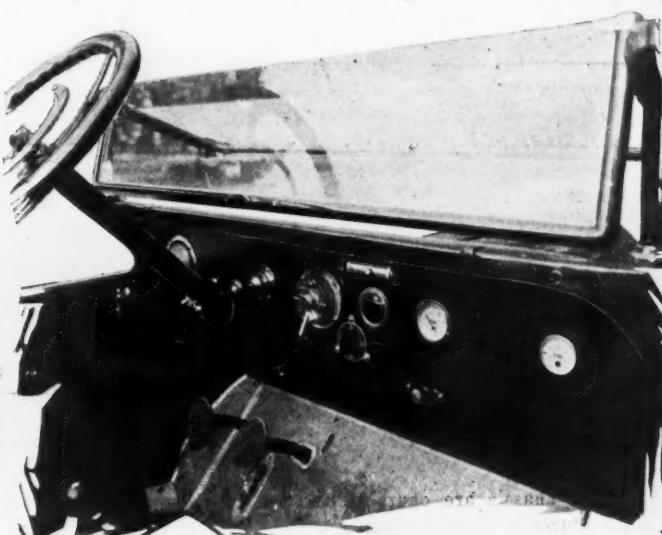
Model 6-50 is almost identically the same design except the motor. From the engine back the larger four and six are identical. The Continental engine with its cylinders cast in threes has been described in these columns before. The arrangement of the Gray & Davis electric system is similar to that of the four-cylinder car.

Model 5 differs from the larger four in the block casting of its cylinders, in the arrangement of its timing drive, which, however, is a silent chain as in model 9. Cooling is by thermosyphon in little four, the fuel tank is under the front seat and is gravity feed instead of pressure feed. The cranking motor drive is through a ring gear on the flywheel. Lubrication is by combined force feed and splash system. The cam and magneto shaft drive is through a triangular silent chain with adjustable centers. With the triangular drive, the centers necessarily are far apart and ordinarily at high



CARBURETER SIDE OF MODEL 9 MOTOR

Valves are on other side and intake pipe passes over cylinders. Note accessibility of magneto



COWL INSTRUMENT BOARD OF VELIE

At lower left corner is shown end of gearshift lever, which is against cushion where it leaves the floorboards clear

speeds the chains assume a whipping motion. This tendency is eliminated in the 35 motor by employment of special chain shoes which insure a noiseless drive.

An arrangement for the automatic alignment of the magneto with its chain drive is provided. When slack in the chain is to be taken up this is done by moving the magneto chain sprocket. To prevent having to realign the magneto the sprocket is mounted upon an eccentric bushing and the adjustment of the chain is by moving this bushing without disturbing the magneto itself. This is a new feature for which patent has been applied by the Velie company.

A unique suspension of the motor is provided. This is a three-point system, the forward end of the motor being hung at its middle point on a pressed steel cross member. At the rear it is suspended from the frame side members on a tube which passes through extensions on the crank-case the tube being trunnioned to the frame. The rear end is hinged for up and down motion with sidewise motion at the front.

New Velie Bodies

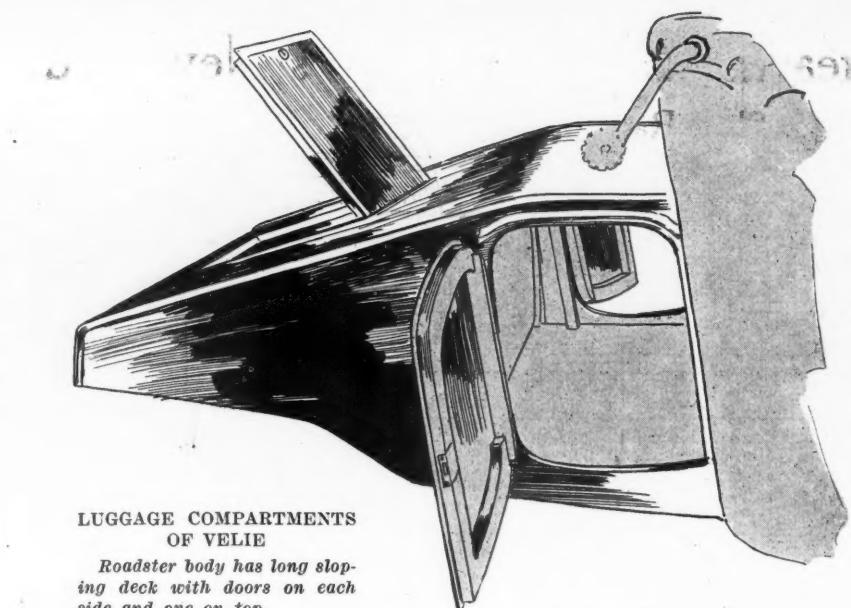
Bodies of the new Velie cars exemplify the present trend for straightline type and clean running boards and graceful contours. One of the features of the bodies is the sloping hood with the long undercut cowl and crown fenders with flat strip at the edge. A Velie feature is the double overlaid hinge of the bonnet which makes it remarkably strong. The weight of a 180-pound man in the middle of the hood does not deflect it noticeably.

Windshields are of the rain-vision type and their attachment is such that they are anchored directly in the cowl without the use of unsightly nuts underneath. A tapered hole in the dash cowl receives the windshield base upon which there is a tapered collar, while a nut anchors the bracket to the socket, drawing the tapered collar into firm attachment between bracket and socket. The windshield base-board is provided with a felt backing to eliminate any chance of rattle. The instrument board in the cowl is leather-faced and all instruments are set flush.

One of the novelties in bodies is the roadster. This has a sloping rear deck with doors on each side, which will take two suitcases each, and a door on the deck for other luggage. The forward compartment is exceptionally free from obstruction. This is obtained by the location of the control levers against the forward seat.

Integral with the brackets for carrying the gasoline tank on the rear of the frame are the heavy brackets for the extra tire. The gasoline tank is fitted with a Tanner gasoline gauge and an air pressure gauge for the fuel line is fitted on the instrument board.

The double drop frames with



LUGGAGE COMPARTMENTS
OF VELIE

Roadster body has long sloping deck with doors on each side and one on top

the underslung rear springs give the cars a low-hung racy appearance. On the five-passenger cars the dash lights are inset, while the bullet type of side lights are fitted to the four-passenger cars and the roadster. The top equipment is character-

ized by use of the new Apen chain top holder, which has the characteristic of tightening up instead of loosening on rough roads. The holder is a spring ratchet affair which holds the top rigid when it is folded back.

French Chassis With Unusual Features

Laisne Uses Only Fourteen Bolts

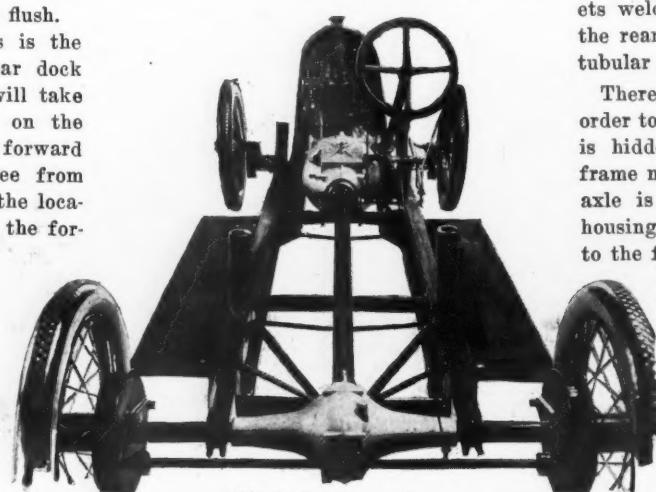
LEON LAISNE, a Douai, France, manufacturer, has produced a car said to have only fourteen bolts in its construction, entirely flexible without the use of ordinary leaf springs, and only weighing 1,650 pounds, with a four-passenger body and a 16-horsepower water-cooled motor. Douai is in the center of a district possessing miles upon miles of rough granite paved roads on which the best cars are often quickly shaken to pieces. The Laisne chassis has been produced specially to meet these unusual road conditions, and in its construction a good deal has been copied from aeroplane landing chassis.

The frame members are roughly in-

verted U section and are a one-piece stamping with the running boards. These latter are stiffened by welded-on webs underneath. The two frame members, which are straight throughout their length, but have a greater depth at the rear than elsewhere, are united by four tubular cross members, with some diagonal stays from the rear member. All the cross members are welded to the side frames. The motor is a standard type Chapuis-Dornier of 2 15/16 inches by 5 1/8 inches bore and stroke, with a planetary gearset bolted up to the rear face of the crank-chamber, forming a single unit. This power plant is carried at the front on two brackets welded to the frame members and at the rear is held by a collar to one of the tubular transverse members.

There are only three bolts to withdraw in order to release the unit. The exhaust pipe is hidden within the inverted left-hand frame member and welded to it. The rear axle is built up of a central aluminum housing and two steel tubes. Connection to the frame is made by two levers which

are connected to the axle tubes by a spherical joint, pass inside the inverted U of the frame and are pivoted to it. At the front end of the lever is a vertical rod passing within a tube welded on the top of the frame member and containing three coil springs. Springs are of different strength and work progressively.



LAISNE CHASSIS IN WHICH ONLY FOURTEEN BOLTS ARE USED

Stearns-Knight Introduces New Body Styles on 1914 Cars

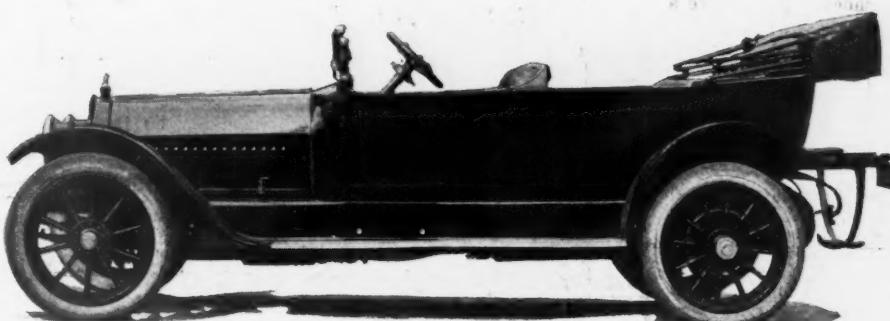
Models Show Radical Departure from Traditional Design in Details

ACTIVITY in the field of body designs seems to be increasing among motor-car makers, and the influence of European styles in superstructures is making itself felt more keenly. Although most manufacturers have determined pretty certainly at this time the details of the mechanical portion of their products for 1914, many of them are undecided as to body details. Mechanical features of the Stearns-Knight for the coming season were described in Motor Age as early as July 31, but since then there has been decided development in the Stearns body maker's department.

Stearns-Knight Bodies

Two of the new models which The F. B. Stearns Co., Cleveland, O., has added to its line this year—the four- and six-passenger touring cars—embody a number of features which are new to this country. It is possible that the recent visit of one of the Stearns officials to the plants of some of the prominent European manufacturers—particularly that of Van den Plas, famous body-maker of Belgium—may have something to do with several of the new ideas incorporated in these cars, as the innovations are almost entirely in body design. The chassis—both four- and six-cylinder—are the standard Stearns-Knight chassis which have shown themselves in 2 years of service to be as advanced as any of European construction.

The new bodies are striking in their lines—the clean edges, unbroken by projecting upholstery, giving a long, low, rakish effect. This is enhanced by the design of the back of the front seats. The seats themselves are low, and the back projects much less above the top of the body than in the ordinary design. The back is surmounted by a distinctive cowl, and although this cowl is flush with either



NEW STEARNS-KNIGHT SIX-CYLINDER SIX-PASSENGER TOURING CAR

edge of the body at its extremities, it is covered with the smooth dull leather used in the upholstery, so that it does not seem



AUXILIARY FOLDING SEATS OF STEARNS-KNIGHT

These chairs, when folded down, are practically invisible, being concealed by the leather curtain back of the front seats

to break the straight sweep of the body line from windshield to the kick-up at the rear.

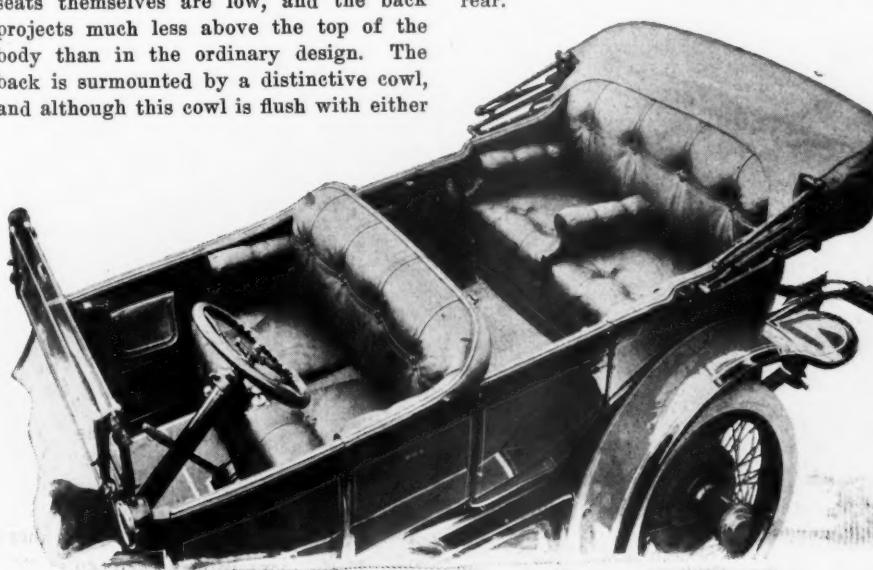
Of the body details most noticeable, perhaps, is the upholstery—one feature of the car which has changed very little in appearance since the early days. An idea of the manner in which the Stearns company has broken away from the customary design may be gained from the accompanying photograph showing the interior of the four-passenger model. The upholstery is of smooth, dull-finished leather, the seats and back cushions being crossed laterally on each surface by a narrow band of the same material. Attached to these bands by small square leather plaques are similar bands which extend over the edges of the cushions. Each of the small leather plaques carries four small buttons, the bands and buttoned plaques together giving just the right relief to the general smoothness. A decidedly novel and attractive effect has been produced.

The arm-rests, instead of being merely an extension of the upholstery along the top of the body, are of the round type familiarized by the leather arm chair, and are placed below the edge of the body, one of them also dividing the rear seats. None of the upholstery projects above the top of the body, although the dull leather is carried over the top edges of body and doors, as well as over the cowl-back of the front seats.

Novel Extra Seats

Another departure from the ordinary design is seen in the auxiliary seats of the six-passenger car. When not in use they are particularly invisible, the legs, or rather supports, forming part of the tonneau floor and the seats and backs being hidden by the leather curtain back of the front seats. One of the photographs shows this construction—the chair nearest the camera being folded down and the further one in position for use. A single upward pull places each chair in position—an excellent example of increased facility in handling without sacrifice of comfort.

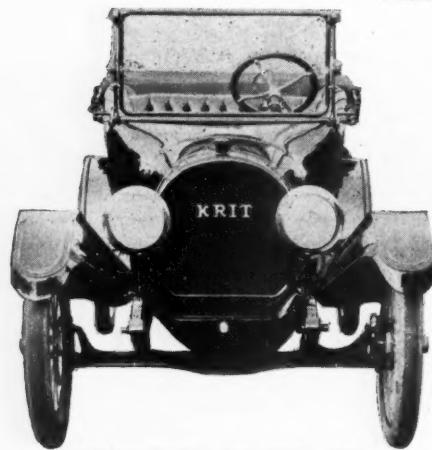
In addition to these new features of body design, both the four- and six-passenger models are equipped with one-man tops especially designed for quick handling. The top is carried forward over the operator's head and clasped to the top of the windshield at each side by a ball-and-socket arrangement.



INTERIOR OF NEW STEARNS-KNIGHT FOUR-PASSENGER TOURING CAR
Notice the unique treatment of the upholstery and trimmings. The six-passenger body is the same except for the greater length and auxiliary seats

Krit Pins Its 1914 Faith to One Four-Cylinder Chassis

Refinements the Order for Coming Season



FRONT VIEW OF NEW KRIT

THE activities of the Krit Motor Car Co., Detroit, will be confined to the production of a single four-cylinder chassis model for 1914 on which will be fitted roadster and touring car body types. The chassis is practically the same mechanically as the one used at present, but the body designs are so radically different that one scarcely would recognize the cars as bearers of the Krit nameplate from their outward appearance. The new dress, however, is easily the best and most stylish with which the Krit has ever been clothed, and puts the car to the front as one of the representative low-priced models of the new season.

Late Body Design

The body design is of the latest streamline type, and beginning with the rounded-top radiator, the line runs unbroken to the rear. The hood with its rounded top slopes to the back and here meets the cowl smoothly. The latter sweeps out into the body proper in up-to-the-minute fashion. The sides of the tapering bonnet are provided with diagonal vents which lend a distinctive touch. Fenders, too, are in accord with the latest style, conforming rigidly to the curve of the wheels in the rear, and breaking away from this wheel-curve somewhat in front.

Other refinements pervade the entire body construction and give a finish to the job. Wide doors with concealed hinges and handles are used, and whereas on the present model there is no door on the drive side, the new Krit, due to the front seat position, permits entrance from either side. The inside of the body is leather-lined, this also applying to the back of the front seat, preventing the unsightly appearance of scratched finish as found in cars where there is no protection at this point. The

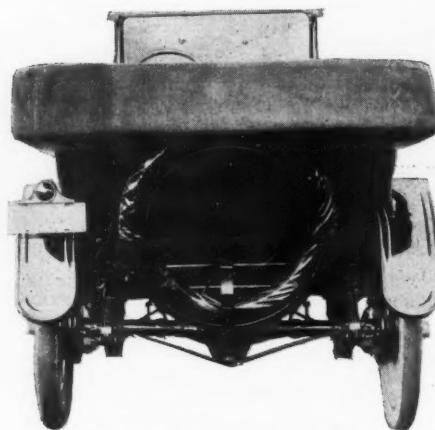
corrugated pressed steel running boards also have disappeared and in their place appear the cork-linoleum covered type. This covering is used besides on the floor boards, which are aluminum-lined.

Fuel Tank in Cowl

A striking new feature of the 1914 Krit is the placing of the gasoline tank under the cowl, a construction which is becoming very popular in this country. The filler is on the right of the leather-covered instrument board. The tank holds about the same amount as does the under-the-seat type used at present. Ten gallons may be carried for direct use, while a 2-gallon reserve also is held.

Also to carry out the streamline appearance, no side lights are fitted, the head lamps being used alone. The wiring is such that these lights may be switched into series for a dim light for city driving, while the switch also may be operated to give parallel wiring for bright glow.

Though retaining its general constructional features and dimensions, the Krit motor has undergone some refining in



REAR VIEW OF NEW KRIT

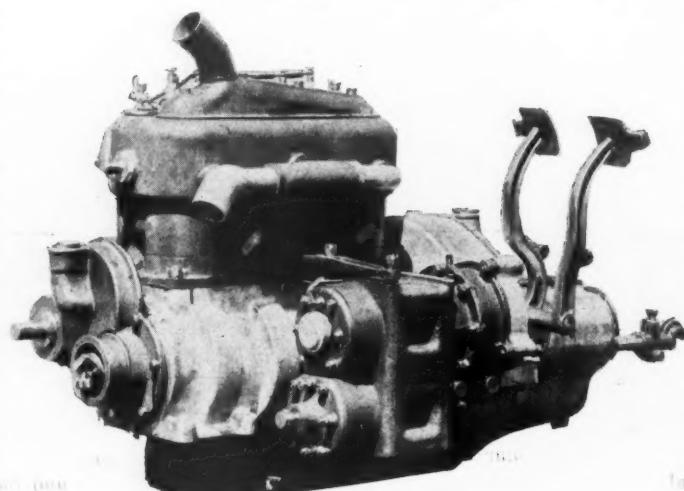
order to reduce the weight of the reciprocating parts. This allows 25 per cent increase in the motor speed, or from a maximum of 2,400 to 3,100 approximately. The result is a much quieter engine, vibration being greatly reduced.

The cylinders are of the L-head type, cast in block with a bore of 3 1/8 inches and a stroke of 4 inches. The horsepower is about 25 and the dimensions give a total displacement of 176.7 cubic inches. Valves are all on the right. The gearset is in unit with the engine and makes a unit power plant construction, three-point supported. There is a single support at the front end, while integral crankcase arms run out to the side frame rails at the rear of the engine.

Motor Details

Intake and exhaust manifolding is on the right, the exhaust header passing along the casting above the intake. The placing of the gasoline tank under the cowl allows the carburetor to be raised somewhat and this results in a somewhat shorter intake manifold, although it is of the same form as heretofore used. Since thermo-syphon cooling is employed, a large water outlet manifold having a 2-inch diameter is used. The water inlet pipe is on the left side and connects to the water-jacket at two points.

Nothing has been changed about the crankshaft, which is carried on two ball bearings. In lightening the working parts, the greatest weight has been taken off the pistons, which are of entirely new design, though of the same length. For the four pistons, the total reduction in weight is about 3.5 pounds—a material difference in the lessening of vibration. The top three rings are used instead of four; larger oil holes have been cut around the piston



NEW KRIT MOTOR

Showing the mounting of the Disco electric motor and generator on left side. The two really are separate but are combined in the one housing in double-deck fashion

reduced which makes smaller boss diameter; one set screw holds the piston pin instead of two. In addition to these factors for lessening weight, Wasson-peened concentric rings replace the formerly-used eccentric type. These are made shallower and not so wide without reducing their strength, which could not be done with the other rings.

Another weight-reducing factor comes in, due to the decreasing of the piston pin diameter from 1 inch to $\frac{3}{4}$ inch. This is the lightening of the upper end of the connecting rod.

Another evidence of refinement is found in the lower connecting rod bearings. These formerly were of pored babbitt type, but in the new motor bronze-backed babbitt bearings are used with adjusting shims.

A different profile has been given the cams so as to increase the efficiency of the gas entrance and exit from the cylinders. The lift of the valves, however, still is $\frac{3}{2}$ inch. Spiral timing gears are used.

Oiling of the motor is rather unusual in that the flywheel is used as the pump to elevate the lubricant so that it can run down to the troughs and timing gears. A 1-gallon reservoir is carried below the crankcase, and the lubricant is conveyed from it back to the lower part of the flywheel housing. The flywheel rim dips into this supply of oil as it revolves and carries the oil up, throwing it off by centrifugal force into a cup from which it is piped into the crankcase troughs. Thence it is splashed by the connecting rod ends into the cylinders and to the bearings. Drain holes at the proper level return the oil to the reservoir. Oil from the flywheel housing also is carried back to the gearset by a spiral groove in the clutch shaft.

Disco Electric Equipment

The electric equipment which is fitted to the new Krit consists of a Disco cranking and lighting outfit, from which the Bosch ignition system is entirely separate and distinct. Bosch fixed spark ignition has been superseded by the variable spark variety with the magneto located on the right side of the engine and shaft drive.

The Disco generator and cranking motor of the so-called double-deck type are used. That is, although motor and generator are really separate, there being an individual armature for each, they are housed integrally, the generator portion being above the motor. The unit is mounted on the left side of the engine close to the flywheel. The connection to the engine is through gears for both parts, a spiral gear on the end of the armature shaft of the cranking motor meshing with a similar gear attached to the flywheel. Inside of the top gear there is a roller clutch which

releases after the engine has started so that the train of gears stops running after cranking and at the same time no gears have to be thrown in to engage engine and motor. The reduction between the engine and its cranking motor is 21 to 1, while the generator is driven at twice engine speed.

Switches Prevent Overcharge

This Disco installation is of the 6-volt type and works in connection with a 100 ampere-hour Willard storage battery which is hung on the right side of the chassis under the front floor boards. This battery is capable of giving out $7\frac{1}{2}$ amperes for 10 $\frac{1}{2}$ hours. Suitable switches prevent the overcharging of the storage battery and provide for the lighting of the lamps direct

ing in conventional fashion and contains strong chrome nickel-steel gears to give three forward speeds. Back of the gearset, the power is transmitted to the rear axle by a vanadium steel drive shaft enclosed within a torque tube. At its front end, this propeller shaft is provided with a Spicer universal joint which also is enclosed.

The torsion tube bolts through a flange to the rear axle, while radius rods run from the ends of the axle housing to the front end of the tube. Thus the drive is taken by the tube and rods, relieving any strain from the springs and permitting them free action. The rear axle is unchanged in design, it being a semi-floating type. Hyatt roller bearings are used

throughout this axle with a ball thrust bearing on the drive pinion. External contracting service and internal expanding emergency brakes act on the wheel drums in the conventional way. The drum diameter is 10 inches and the width 2 inches.

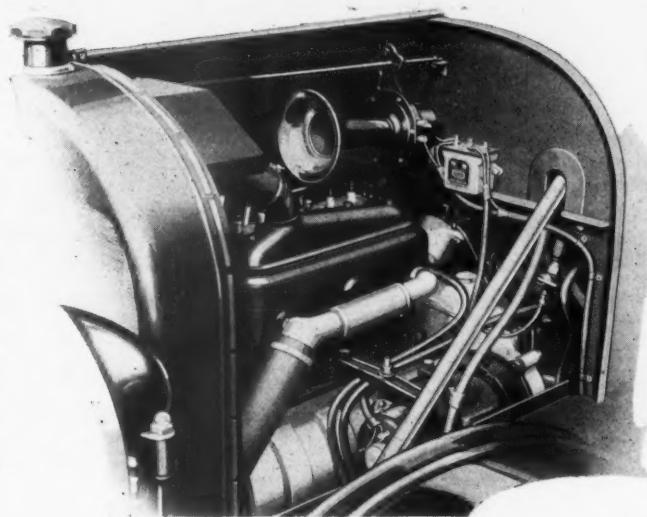
The spring suspension has come in for no alteration, the front springs being the standard semi-elliptic type and the rear being elliptic with scroll rear ends. These rear springs are underslung from the rear axle as in the past, allowing the body to be hung low.

Left drive and control are retained. The steering wheel diameter, however, has been increased by 1 inch to 17 inches. A unique feature in connection with the pedals is the placing of a corrugated metal pan under them so that in driving the heels rest in this pan and slipping is prevented. This pan is about 10 inches square and sets down into the floor board 1 inch. The driver thus is assured that his feet will not slip.

Increase in Wheelbase

The wheelbase of the new Krit is 108 inches—2 inches greater than that of the 1913 model. This increase in wheelbase is utilized in the provision for more ample room in both the forward compartment and the tonneau of the new Krit cars.

The price is about the same as that of the present model, but it includes very full equipment. For either touring car or roadster model \$950 is asked, this covering everything except the Disco electric cranking equipment. When the latter is fitted, the additional cost is \$100. In either case the standard equipment includes a mohair top, quick-acting curtains, top boot, double ventilating and rain vision windshield, Stewart flush-type speedometer set into cowl board, electric horn under hood, full lighting apparatus, robe and foot rails, demountable rims with one extra, 100 ampere-hour Willard storage battery, tire carrier at the rear, tools, jack and pump. The tires are 32 by $3\frac{1}{2}$ inches in size as at present.



LEFT SIDE OF KRIT MOTOR
Showing installations of motor generator and switches, also horn

from the battery at night when the engine is not running to drive the generator. A reverse current cutout also is provided which prevents the battery from discharging back through the generator.

The generator starts charging at a motor speed of 700 revolutions a minute and reaches its maximum output at a car speed of about 10 miles an hour on direct drive. The electric motor, drawing in the neighborhood of 100 amperes current, cranks the engine at a speed of 120 revolutions a minute, which is somewhat faster than the average rate of spinning a motor. This of course applies after the engine has been limbered up. The weight of the combination motor and generator is 75 pounds, including the integrally-housed gear reductions.

Housed with the flywheel is the disk clutch which is said to incorporate a patented feature preventing grabbing. Instead of several springs around the clutch shaft to hold the clutch collar, the Krit clutch has a single large spring on which the collar floats, giving equal tension all around and preventing unequal engagement of the different parts of the plates. In this clutch there are ten saw-steel driving disks and eleven driven disks.

The gearbox bolts to the flywheel hous-

Cyclecar Development



AMERICAN MOTORISTS TAKE KINDLY TO THE CYCLECAR FOR PICNIC OUTINGS

Motorcycle Agents Evince Increasing Interest in Cyclecars

Newcomer Barred from Chicago Show

By William B. Stout

CYCLECARS were not exhibited at the 1914 Chicago motorcycle show, held last week, the only representatives of the new industry admitted being the firms showing cyclecar motors with their motorcycle products, these being the Spaeke Machine Co. and the Wizard Motor Co. of Indianapolis and the Mack Motor Co. of Milwaukee.

These firms showed their latest types of motors for cyclecars and were kept busy explaining the cyclecar types. To the casual listener more of this talk seemed to be on cyclecars than on motorcycle motors.

Firms which tried to exhibit cyclecars at the show were not admitted, there seeming to be a prejudice on the part of the manufacturers against the display of the new vehicles on the same floor as the motorcycles. The undercurrent of cyclecar talk throughout the show was noticeable, however, especially amongst riders and dealers, rather than among those higher up.

Motorcyclists Posted on Cyclecars

It was evident that, though the average motorcycle maker and big man in the motorcycle industry is far from posted on the cyclecar movement and its possibilities, having had all of his information from the motorcycling press, the small dealer and the riders as a rule are well posted and filled with interest.

This fact is well illustrated by the change of sentiment seen in this year's

opinion on the cyclecar. The result was the same old bromidic line of argument, "What will the cyclecar do if the small car comes down \$100 in price? What chance will a narrow tread have on American roads?"

The general attitude last year was one of sneering, and one motorcycling paper which had the progressiveness to discuss the cyclecar seriously was quickly switched back to two-wheeled exclusiveness in all its pages. To mention the cyclecar in the motorcycle booths last year was to start something.

Motorcycle Interests Alarmed

The writer made the same kind of a trip last week through this year's show and asked the same line of questions. The attitude is entirely different on the part of most of the dealers present, for they have posted themselves on the new motoring. The makers of two-wheelers, however, seem to wish to remain in ignorance and to take refuge behind scoffing, instead of realizing the new movement as an opportunity for enlargement and advance.

Last year a certain motor firm listened to the writer's cyclecar talk with all due courtesy, and agreed that there were possibilities in the cyclecar but not enough to take it very seriously as yet. Less than a year has gone by and that firm now is furnishing motors in quantities to several cyclecar firms, and has more than 100 motors in use on experimental cyclecars alone.

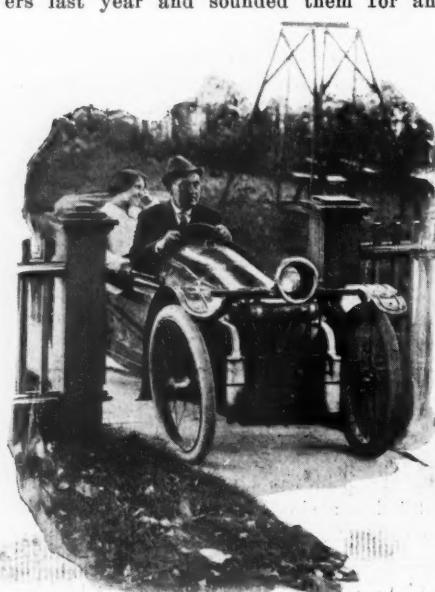


ILLUSTRATION SHOWING HOW IMP CYCLECAR CAN PASS THROUGH A GATE

Another motor builder when approached 1 year ago on the cyclecar subject admitted the future of the cyclecar, but took the same attitude of its being too far off. Today this firm's plant has been doubled in capacity to handle its cyclecar motor business, and a recent order, it was stated, was for the entire plant output of one type of motor. This business has grown so in 1 year that 90 per cent of the motors now made by this firm are for cyclecar work.

Salesmen about the different motorcycle booths either were ignorant of the movement as being in existence at all or were enthusiastic as to its possibilities. The bigger men as a rule made no direct statements but asked questions, and were greatly surprised to know of the size the new motoring has attained already, even though cars are not yet being delivered to buyers. Many, skeptical at the start, were half convinced after seeing that someone else really had spent money on the industry.

Dealers Wanted to Talk

Dealers about the booths were ready to talk and a fair percentage showed that they had been reading of the cyclecar from a different angle than that given out by the motorcycling press. Questions asked showed they were posted. Several stated that they had taken cyclecar agencies in connection with their other line.

"If you don't believe in the cyclecar," said one dealer to a doubtful man in the motorcycle industry, "go where I was this morning. I went into an agency on Michigan avenue to meet a friend and waited for him 1 hour. In this agency



NEW ON AMERICAN ROADS—WOMEN DRIVING A CYCLECAR

was one cyclecar in the window, and on the street was another running in demonstration. This room was a mile from the motorcycle show and had run little advertising, but the room was packed all the time I was there. The crowd asked intelligent questions.

"While there in the 1 hour I saw \$2,500

in checks, deposits on cars, pass over the table to the man behind the desk. This man was not a salesman, either, and there was little explanation of the car, only of terms. As near as I could size it up, all these men were in Chicago to attend the motorcycle show, but they were getting into the new motoring."

Steering Gear for American Cyclecar

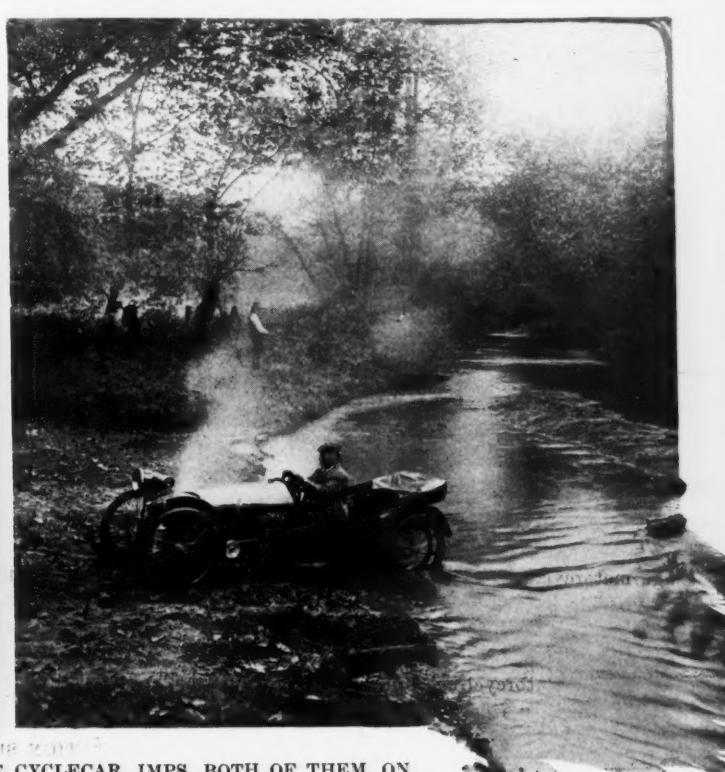
Benham Company's Latest Offering

RECOGNIZING the coming demand for cyclecar parts by many who will do little of the actual manufacturing of the small machines which they sell, the Ben-

ham Mfg. Co., Detroit, Mich., which for several years has made steering gears and other parts for motor cars, has brought out a new steering gear which is specially



WHAT WE MAY EXPECT IN THE FUTURE—THE CYCLECAR. IMPS, BOTH OF THEM, ON COUNTRY TOURS



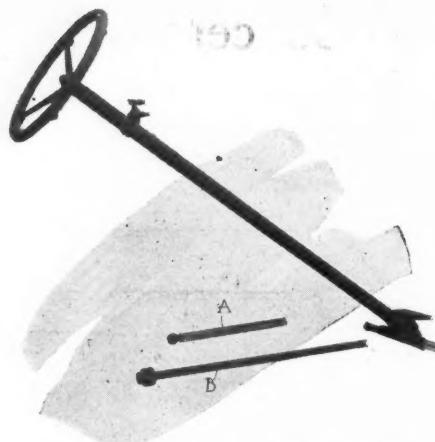
adapted for cyclecars. This gear, which is designated as type A, is a modification of a type made by Benham for cars of about 25 horsepower and 2,400 pounds weight, being simplified and adapted to the requirements of the little machines.

The Benham cyclecar steering gear is illustrated herewith. It is a rack and pinion type, and the teeth are said to be cut at the proper depth and pitch to give the utmost strength combined with ease of operation and durability. The gear is so constructed that one and one-half turns of the steering wheel give the full rack travel of $7\frac{1}{2}$ inches from the extreme left to the extreme right. The rack has nineteen teeth, while the pinion is provided with twelve teeth. Although the horizontal bar, shown at A, of which the rack is a part, ordinarily is provided with a ball end for the steering connections, a cylindrical end may be had if desired.

The gear is adapted to either right or left steer and by a simple attachment can be used for center steer as required by the narrow tandems. Either overslung or underslung frame cars may be fitted with it. The anchorage of the housing or gear proper is to the lower side of a cross member for overriding frames and to the upper side for underslings.

The post B, which carries the pinion at its lower end, is encased in a $1\frac{1}{2}$ -inch tube and swung by a special cyclecar steering wheel 15 inches in diameter. The spider and rim are black enameled. The spider has four arms, while the rim is $1\frac{1}{8}$ inch thick and $\frac{1}{8}$ inch deep in section.

An upper anchorage is provided for the cowl or instrument board, as shown in the illustration, making a very rigid assembly. The Benham gear is furnished either without controls where set spark and foot throttle are employed, or with one or two controls, as desired.



BENHAM CYCLECAR STEERING GEAR

This steering gear is to be marketed at a price for quantity business, which should suit the manufacturer of the small car. Besides this type of gear, the Benham company is to market a fore-and-aft gear which also is designed specially for cyclecar or small car use.

DE LUXE PLANETARY GEARSET

The Spacke Machine Co., of Indianapolis, believing in the future of the cyclecar, has developed a planetary gearset especially for cyclecar use, and applicable to shaft or belt drive cyclecars. It can also be used with chain drive cars. Like the motor, it is called De Luxe.

The illustrations show the general appearance of the new product and how the belt pulleys can be attached, the chain from the motor running to the large sprocket as shown. The gearset gives two speeds forward and reverse, and has been used with success on several cyclecars to date.

The gearset was produced in an endeavor to get the simplest possible form of

gearset, giving the least trouble and low upkeep. It is the simplest thing which makes the appeal in the cyclecar, and there has already been quite a demand for the new planetary from those who prefer the positive gear drive to friction types.

THE PACIFIC MOTOR

The four-cylinder motor shown in the illustration is a new product intended especially for cyclecars, weighing under 100 pounds and developing about 10 horsepower. It is being made by the Pacific Mechanical Co. of Los Angeles, Cal. The motor specifications are as follows: Bore $2\frac{1}{2}$ inches, stroke $3\frac{1}{2}$ inches, valves $1\frac{1}{4}$ diameter. The crankshaft is $1\frac{1}{4}$ -inch diameter of the two-bearing type, the bearings being 3 and $3\frac{1}{2}$ inches long respectively. The flywheel is 11 inches in diameter with a $2\frac{1}{8}$ -inch rim. The crankcase is aluminum, and the motor air-cooled by a fan, this being 12 inches in diameter. A special set of hangers is arranged so that the motor can be fitted to any type of car or drive, hung by $\frac{7}{8}$ -inch bolts. The cylinders are T-head with the rest following car practice except cooling.

DE CROSS CY-CAR PROVES ITSELF

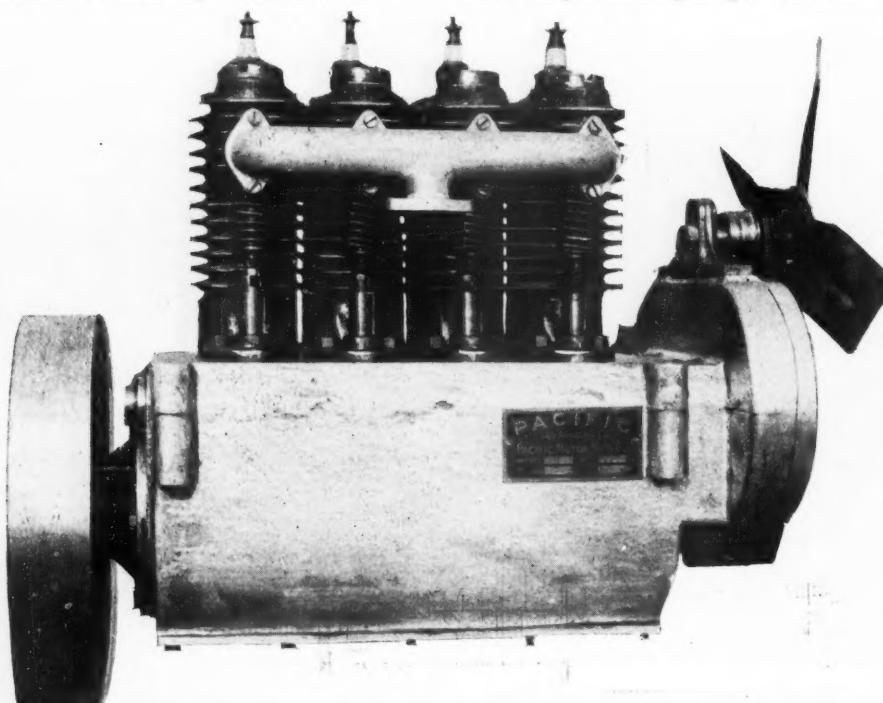
The De Cross Cy-car has been on the road now for about a month, according to its builders, G. A. Doeller and Powel Crosley, Jr. The car with its friction transmission and air-cooled motor runs very satisfactorily, says their report, and "can show its tail light to most anything on the road."

On the first trial trip a run was made from Cincinnati to Hamilton, O., and return with no trouble or even adjustments, the distance being about 45 miles—and made on a gallon of gasoline. Fifteen miles of the return trip was covered in 45 minutes, when a stop was made to light the lamps. A number of other such trips, in all about 250 miles, have been run with the same success.

A NEW MACK CYCLECAR MOTOR

The Universal Machinery Co., of Milwaukee, maker of the Mack cyclecar motors, has announced a new cyclecar motor with an extension fitted to the crankcase so that the friction disk can be attached directly to the power unit, as in the sketch. To take the strain of the friction system the shaft is made extra heavy and long, with a large self-contained thrust and annular bearing in the crank-case extension itself to take the extra thrust load. This motor is fitted with a fan and a special pump oiling system, and is made throughout especially for cyclecar work, being used by several prominent cyclecar makers.

The same firm produces also a chain-drive type of motor fitted with outside flywheel and heavy shaft and bearings to take care of the end load. It is claimed that these motors have developed 15 horsepower on the block.



FOUR-CYLINDER, AIR-COOLED CYCLECAR MOTOR MADE ON PACIFIC COAST

Answers to Inquiries Concerning Cyclecar Construction

BELT DRIVE AND ROAD CLEARANCE

Ordinary 18-Inch Motorcycle Pulley Is Not Too Low for Cyclecars

CONDA, IA.—Editor Motor Age—Does Motor Age think that the rear V-belt pulley should have plenty of ground clearance, say at least 8 inches and would that interfere with the gear ratio? If one goes in very deep ruts it would not do for the V rim to be damaged by dropping down in a rut and stripping.

2—Where the seats are on the frame and only, say, 8 inches from the top of the seat to the bottom of the floor, would that not naturally tire the person to ride much?

3—Also would it not be difficult, in cars that have no doors, and belts running from front of car to rear, to get in and out by having to climb over the side? How high would the sides necessarily be in such a car?

4—Would there be much pushing out of the wheels and thereby wear on tires, where there are no axles but cross-springs in place of axles? When a load is put on the springs and brings them down would they not tend to widen the tread, and thereby cause wear on tires?

5—Is the wire cable steering used on some cyclecars satisfactory?

6—What form of springs are best suited for cyclecars, that is, those running crosswise or of common three-quarters or elliptic?

7—Is 8 inches road clearance enough or should it be 10 inches? I would say 9 or 10 inches.—Chas. G. Messenger.

1—The ordinary 18-inch size of motorcycle pulley does very well for cyclecar use, as there is plenty of clearance at the rear for all ordinary conditions, and strength enough in the new pulley rims to stand ordinary shocks. In using friction without an extra shaft a large rear pulley must be had in order to maintain the largest possible size of front pulley.

2—For this riding position the seats should be about 16 inches long and slightly inclined, and about 42 inches would be allowed from the back of a seat to the footboard of the car. Make a model of the seating arrangement you intend to employ and by use of this you can quickly tell what would be a comfortable position. This front seat must be adjustable fore and aft to accommodate persons of different height.

3—With the side-belt drive there will be very little difficulty in getting in and out if the car is built low so that the sides of the body are not much higher than the belt. The edge of the body should be made strong so that one can step onto it from the curb and then into the body.

4—Cross springs should be designed flat, and then there will be no appreciable roll given to the tires by the spring action and hence no detriment to the tires.

5—This is satisfactory if steel piano wire cable is used. Those who have dropped this steering after trial have tried to use iron cable, which quickly breaks. Use braided piano wire cable around a 2-inch pulley, in duplicate for safety, and you will have no difficulty.

6—Both cantelever springs and cross springs seem to be particularly adaptable to cyclecars. These small vehicles incline at such road angles that springs must be designed to take care of side roll better than on big cars, hence the preference for cantelever type.

7—An 8-inch road clearance is plenty, if the bottom is one straight board or sur-

slightly smaller sprocket on the motor or on the ends of the jackshaft than those given in your sketch. With the 36-inch tread you use you will need no differential and hence can drive with a single chain to the rear axle, thus saving the cost of two sprockets and an extra chain.

FLAT OR V-BELTS FOR THE DRIVE

Discussion of Relative Merits of Types of Drive.

Brooklyn, N. Y.—Editor Motor Age—In all the matter that Motor Age has published on the cyclecar no mention has been made of the use of flat belts. Would not the use of flat belts give a higher efficiency than V-belts, besides allowing the use of an idler to give greater contact without excessive strain on the belt and consequent increased friction?

2—Would the flat belt be liable to give trouble through being exposed to moisture?

3—Would it be liable to be thrown from the back belt wheel owing to the wheel springing out of line?

4—How would the cost and durability compare with the V-belt and what size belt should be used?—Stephen Symons.

1—Flat belts are more efficient than the V if made wide and thin, but are more likely to be thrown off the pulleys by the road distortion of the rear axle and will not work with snow or slippery mud under the pulleys, as will the V-belt. An idler is not necessary and is a detriment.

2—Moisture will not seriously effect the flat belt.

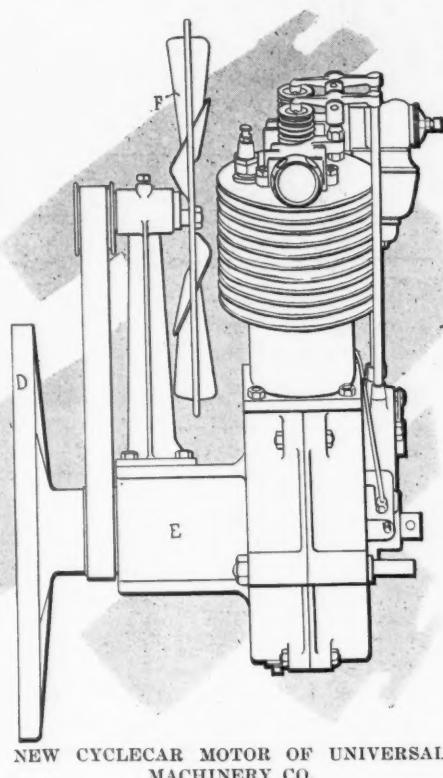
3—Yes.

4—Will cost about the same. Belts about 2 inches in width should be used, and not much over $\frac{1}{8}$ inch in thickness for best efficiency.

One-Cylinder Motor for Cyclecar

New Castle, Ind.—Editor Motor Age—Could a one-cylinder, water-cooled motor with a 4-inch bore and $4\frac{1}{2}$ -inch stroke be used to advantage? I expect to use friction-drive transmission with notched belt to the rear wheels.—E. P. Oliver.

This depends on the design, rated speed in r.p.m., weight, etc. If of the light four-cycle type it will probably do. The friction and belt-drive works very well.



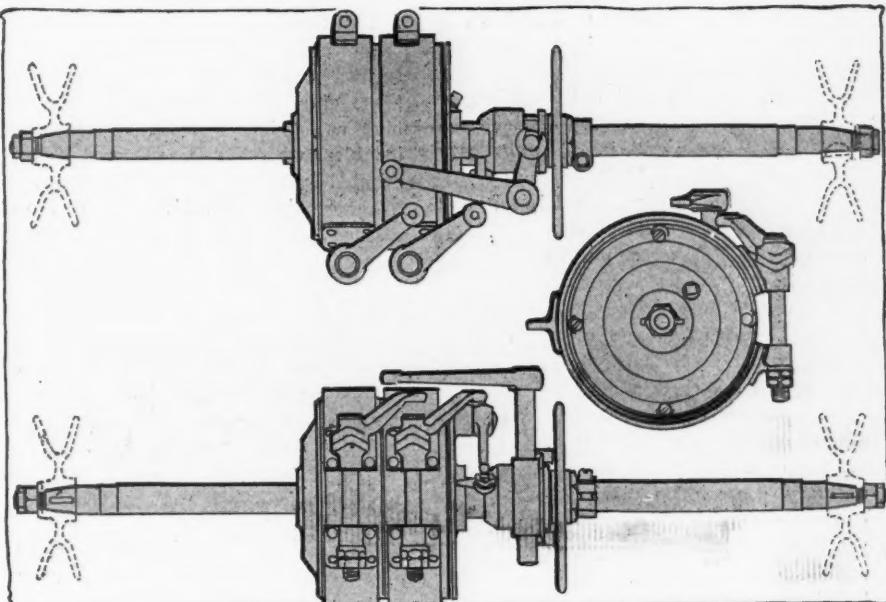
NEW CYCLECAR MOTOR OF UNIVERSAL MACHINERY CO.

face, so that nothing could scrape off if the car should happen to touch in very unusual places.

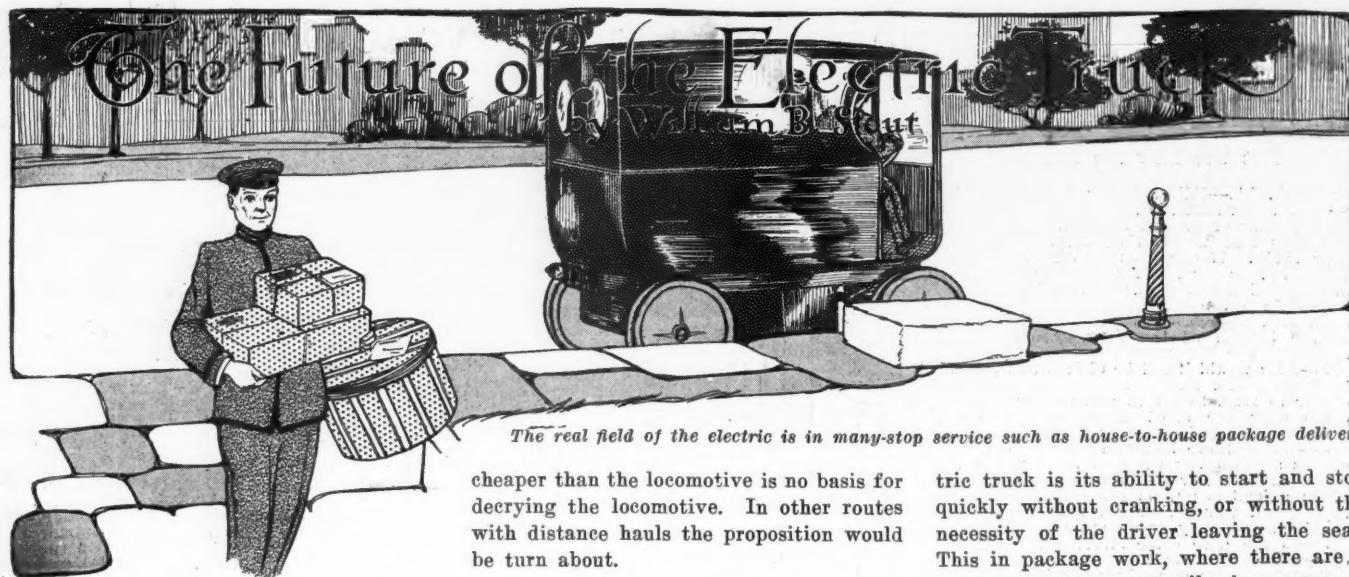
Cyclecar Gear Ratios.

Auburn, N. Y.—Editor Motor Age—I am building a cyclecar which will be driven by a 7-horsepower motorcycle motor and would like to know about what gear ratio would be necessary between the motor and the rear wheel and whether I need to fit a differential.—A Subscriber.

The ordinary gear ratio on cyclecars fitted with the larger type motors is about 4 to 1 on high. With your 7-horsepower motor you probably would need a 5 to 1 gear ratio, which would necessitate a



NEW DE LUX COMBINED JACKSHAFT PLANETARY GEARSET FOR CYCLECARS



The real field of the electric is in many-stop service such as house-to-house package delivery

THE electric commercial vehicle is fast increasing in numbers. Scoffed at at first for blatant defects and costly battery upkeep, the truck has developed and perfected itself until today it stands almost alone in certain fields of work, and is increasing rapidly in numbers in these fields as merchants and business men are coming to see the merits. While the electric passenger car is gaining, the electric truck has even more reason to gain, not the least item in explanation of this being the ease of its road operation by any average driver, and the handy manner in which expense and reasons for expense can be kept track of, for the expensive things take place in the battery room.

Electrics are slower than other types perhaps, at least in small sizes, but they get away quicker and are operated cheaply. They are limited in mileage also, but within this mileage radius for quick-stop and quick-start work have no superior.

Advantages of the Electric

The electric commercial vehicle has certain advantages inherent in its very design requirements, and road limitations, which in themselves mark out for this type of commercial vehicle a very distinct and wide field. There will in all probability always be room for vehicles driven by gasoline, kerosene, steam, electricity, and whatever else the mind of man may conceive of as a motive power in the future, but each will have its own fields where it excels, and a common overlapping ground where there always will be a certain amount of contention as to the better fitness of one type or the other.

No one would think in the ordinary sense of replacing a motor truck with a locomotive, yet there are fields where work can be done better by truck, but because a motor truck in one locality can haul freight

cheaper than the locomotive is no basis for decrying the locomotive. In other routes with distance hauls the proposition would be turned about.

Each type of road vehicle from horse and wagon to heavy tractor has its place and whether one type or another fits best depends on business conditions, road conditions, merchandising conditions, climatic conditions, conditions of personality, conditions of local government, on salesmanship and truck service-station locations, on the fuel and tire situation, on central station managements and price scale, future prospects of the locality, etc., etc. Each individual case in truck installation is a separate study.

Especial Opportunities

To locate the cases where the electric will have its widest field of application then is not to set a rule that these vehicles always should be used in these fields to the exclusion of others for both types are operating in almost every line with success, but merely to point out especial opportunities.

The electric is by the nature of its batteries a heavy vehicle, and hence for efficiency is limited in speed. This in itself is an advantage where service does not call for speed, for the low speed of the electric truck is one of the greatest factors toward the long life enjoyed by these cars. The cars are not subject to high speed jars and the consequent tire troubles, where tires are fitted as recommended by the makers for the work.

The greatest road advantage of the elec-

tric truck is its ability to start and stop quickly without cranking, or without the necessity of the driver leaving the seat. This in package work, where there are a great many stops per mile, is a very essential thing. A part of the ability to start quickly in spite of the weight is due to the motor, as this is capable of working to overload. This means that a 15-horsepower motor, for instance, can develop at the starting periods from 20 to 30 horsepower for short periods. As this power is needed only in periods there is no necessity of carrying a big motor of the full horsepower necessary at any time, all the time.

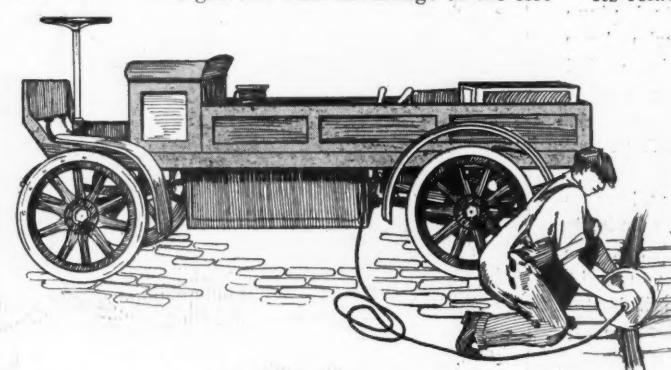
In stopping and starting all operations are simple and all of the control of the car can be understood by the average horse driver after 10 minutes practice. There is little, if anything, besides the driving, that he need know to make a good driver. All he needs to do is to drive. This item of drivers has made many friends for the electric vehicle.

Driver Part of System

The driver is a large part of a delivery system, and his knowledge of routes and customers is far more valuable to a firm than a mere mechanical knowledge of a motor truck, gasoline or electric. As a result many firms prefer the vehicles which their own men, already acquainted with the delivery conditions, can drive. The electric allows of this system more than any other type of motor vehicle.

In trips on electrics in package work the advantages of electric propulsion in its relation to the driver, and his delivery of bundles has been often noted. The driver many times is off the car before it comes to a dead stop, and on his way with the package, the brake being lightly set to hold the car when it stops. When boys are carried, as is generally the case, there never is a fear on the part of the driver of stalling a motor when slowing up for the helpers to jump on or off.

The main item that determines the success or failure of electric installations, however, is the battery equipment and



The electric truck has great advantages in service where auxiliary power is needed for repair work, etc.

maintenance. Given an excellent motor truck and excellent batteries, the truck still is no better than the garage or station that handles the batteries. These take care and watching. If the battery man is an expert, knows his business, and does his work well, there will be no trouble with the equipment. If not, as with any other machine which is not given care, there will be trouble. No machine made is foolproof in every particular, but the electric vehicle is more foolproof on the road than perhaps any other type. Off the road the electric needs this expert attention in the matter of the batteries but here the firm can keep tab on things and see that things are done right in a way impossible on the road. The average electric battery is no better than the man who cares for it.

Good Garages Helpful

In localities where there are good garages with men who know how to handle batteries electric trucks are gaining in favor at a rapid rate, and for installations where there are enough electric vehicles so that the owners can run their own garage and take care of their own battery equipment.

The expense of power per day on

used by the breweries, for instance, this weight ratio drops, so that for trucks of great tonnage, carrying big loads with frequent stops and no requirement of speed the electric again scores. The low speed limits the daily mileage of any type of heavy truck, and the electric motor can give all the speed necessary in a 10-ton truck for instance.

Especially for city work where pavements and roads are in fair condition the electric has a great field in this heavy hauling. This work probably will include brewery work, cut stone hauling, etc.

Another field for the electric is in lines where vehicles go out to do work such as piano moving, street railway construction work, etc., etc., where the batteries can be used to furnish power for auxiliary apparatus. The current can be used to operate a winch, for lifting pianos, or safes, or to work a crane for loading and unloading box goods. All of this is a field for work for the electric particularly.

To summarize, the electric commercial vehicle is particularly fitted for three classes of work: House-to-house delivery, or light work requiring many stops and a mileage up to say 50 miles a day, heavy hauling in cities, where many stops are made, and work where auxiliary

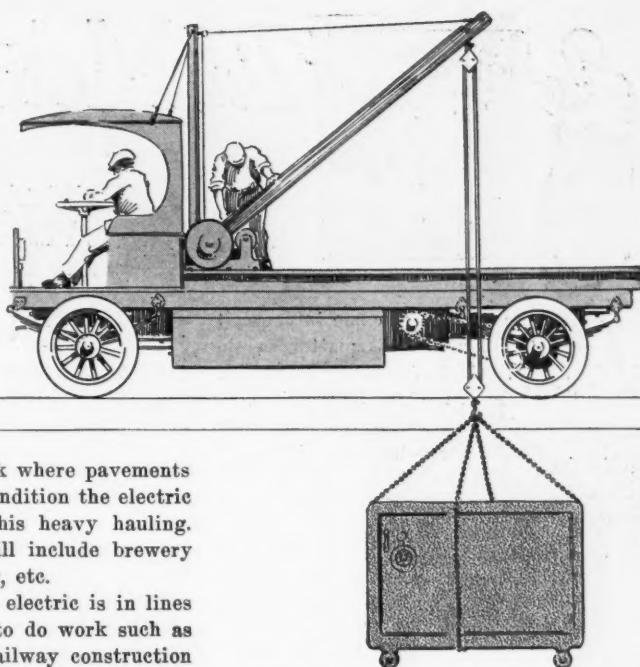
appliances are demanded or can be used.

As batteries and constructions are improving the mileage of the electric truck is increasing. Running costs are being lessened, extra appliances devised to save here and there, while charging methods and instruments are being improved to make battery care cheaper and easier. All of these will have a direct effect on the development of the electric truck, and lead to a greater adoption. As to reliability there is no fault in the electric, this being one of the things for which electrics are noted, so long as batteries are kept charged.

Central Stations Interested

As electric trucks increase in numbers in different localities central stations will give more attention and better service to users. Some electric concerns are just waking up to the fact that the truck gives them an opportunity to profit on the off-peak load.

This and the experience of the firm cited above which generates the current for its



Crane loading on electric vehicles can be accomplished by the power of the vehicle in a very handy manner

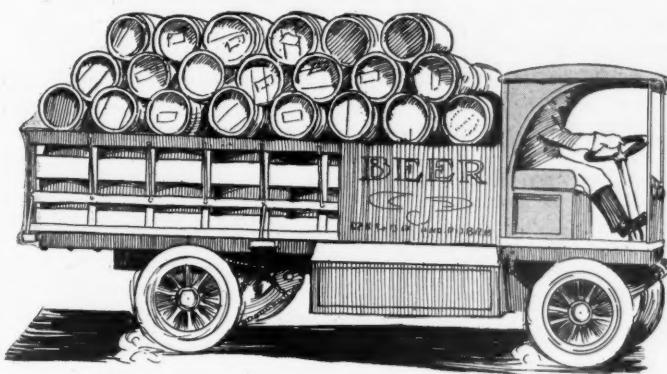
cars for 20 cents a day, point to another opportunity which the electric offers to those firms which have electric power plants as part of their equipment, for if the electric companies can make money off of the off peak time and at low cost it is to the advantage of the other firms as a rule to keep their electrical equipment busy during those hours when the factory or plant does not demand the capacity of the station.

These can arrange the car schedules to place the charging times at hours when the plant is idle perhaps, or running light, and thus use the electric truck at a much lower cost than otherwise, so far as current goes, while the generating plant is helped to produce at all times.

The firm of a size to need an electric generating plant probably would have use for a number of vehicles and the more vehicles used the more of the off peak current could be taken care of, and the more benefit would result to the firm in comparison to other traffic methods. In this way the cost compared to horse service would be very low.

Another feature of the electric truck for house work is its cleanliness and elegance. The electric pleasure car is largely a society vehicle and has a high social standing. The electric package car, finely finished and as elegant in lines, has also an air of refinement and an up-to-dateness that appeals to the housewife and adds considerably to her attitude toward the store with which she deals. All of this has its influence on the business result of the use of trucks in this line of work.

With the betterment of batteries, not only as to extra mileage gained but in foolproofing and extended life, the electric truck will enter new fields and take up work now done by other types.



The electric truck is especially successful in heavy hauling with many stops

house-to-house trucks in some cases where owners operate their own plants comes to but a few cents per day per car. One firm claims a cost, in Chicago delivery work, of but 20 cents per car per day, through the ability to use an already established electric power plant used for running the machinery of the business, for charging the cars in off hours. Ordinarily the current can be had cheaper by other firms from city lines.

Current cost is lower as the current consumption increases, so that the firm with many cars gets a lower rate per car than the one with but one vehicle, making the electric of greater advantage in large number installations. This current situation, together with the idea of operating one's own battery maintenance system points out the probability that the future of the electric lies peculiarly in the large-installation field.

The weight of the batteries in proportion to the load carried is, on small cars, a considerable ratio. On big trucks as



The Motorist's Kindergarten



EDITOR'S NOTE—Motor Age is publishing in this department a series of non-technical explanations of the various parts of motor cars for the benefit of the reader who knows nothing about them. The subjects will be dealt with in the most elementary manner, so that the series when completed will form a simple elucidation of the car.

WHEN the motor car came into use it was found a difficult matter to apply the same method of steering as was in use on horse-drawn vehicles of the time, so an entirely different system was put into practice. In the horse-drawn vehicles the whole front axle was pivoted on what is called a fifth wheel and if the vehicle was made to turn the entire axle turned with the wheels. All horse-drawn vehicles of today employ this method. But in motor cars only the front wheels turn and the axle remains stationary as shown at the left on Fig. 87.

Front Axle Construction

The front axle of a motor car is constructed as shown in Fig. 88. The end of the axle ends in what is called a yoke and this yoke is made to support the steering knuckle. The knuckle is slipped between the jaws of the yoke and a pin inserted through the yoke and knuckle as shown by the dotted lines at D in Fig. 88. Thus the knuckle may be moved on the pin as a pivot. The part which supports the wheel is known as the steering spindle and although the illustration does not show it, the wheel rests upon a bearing placed upon the spindle. The wheel then may be moved—the means to be described later—and the knuckle turns on the pin, which is called the spindle pin.

The device for turning the front wheels is familiarly known as a steering wheel, but the whole apparatus is called the steering gear. This includes the wheel

Steering the Motor Car

proper. A steering gear is a means of converting the rotary movement of the wheel into linear motion of the rod R in Fig. 87. This change in motion is obtained by various types of steering gears, that shown in Fig. 87 being of the worm and

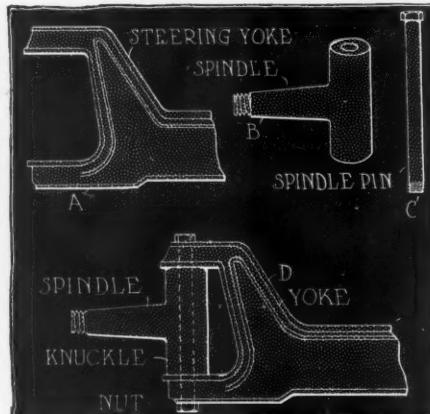


FIG. 88—PARTS OF AXLE STEERING MECHANISM

The knuckle fits between the jaws of the yoke and swings on the spindle pin, thus carrying the wheel around. The wheel is mounted upon the spindle

gear type. There are many others such as worm and sector, worm and wedge, and bevel, and the simplest of all, the rack and pinion, shown in Fig. 89.

In the worm and gear or any of these in

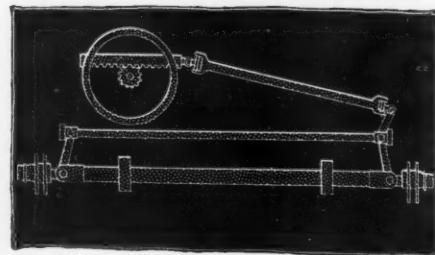


FIG. 89—RACK AND PINION TYPE OF STEERING

The turning of the wheel causes the small gear to rotate and as it does this it moves the rack or horizontal portion with the teeth, which in turn actuates the tie rod

which two types of gears are in mesh, the turning of the wheel actuates a gear which in turn operates another. The latter has a shaft at its center and at the end of this shaft is fastened a rod, designated as R in Fig. 87. Then any movement of the wheel causes the gears to move and hence the rod. In the rack and pinion type the steering wheel operates a gear and this gear in mesh with a rack, or flat piece of metal with teeth on it. When the gear revolves the rack moves backward or forward, according to the direction the wheel is turned.

We are now at the point where the movement of the steering wheel converts rotary motion into linear movement. The next step is to show how this causes the front wheel to turn. By referring to Fig. 87 it will be noted that the rod R is connected with a drag link and that the drag link, as it is called, extends to one of the steering arms L attached to the steering knuckle. The diagram shows the mechanism with right steer, which means that the steering knuckle on the right side does most of the work. The right knuckle has two arms integral with it and, as stated above, one of these arms is attached to the drag link. The other is attached to a tie rod. This tie rod connects with an arm on the other knuckle. Now any movement of the right knuckle will cause a corresponding movement of the left knuckle. In operation, then the turning of the steering wheel operates the rod R and this moves the drag link which in turn causes the knuckles to swing on their pivots. The knuckles, however, carrying the spindles upon which the wheels rest, the latter must turn also. In the rack and pinion type shown in Fig. 89 the same operation occurs as may be seen from the illustration, but instead of a worm and gear, etc., a rack and pinion do the work.

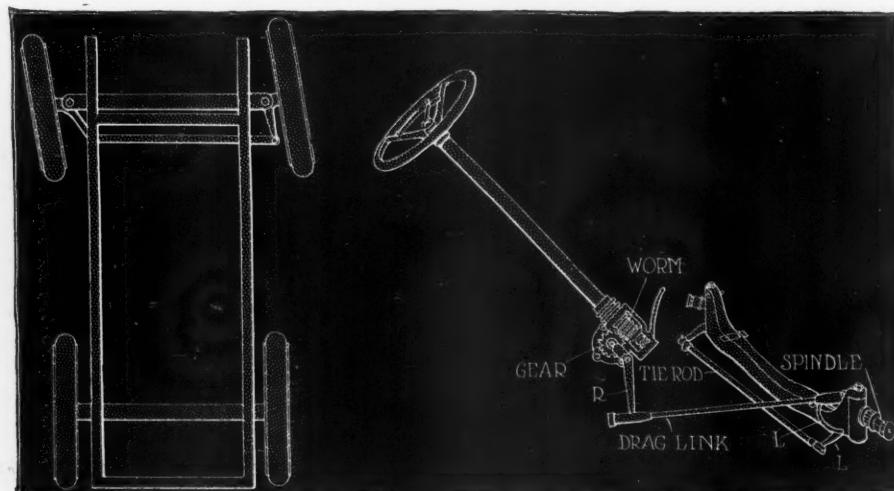


FIG. 87—HOW THE MOTOR CAR IS STEERED

At the left is shown how the front wheels turn and the axle remains stationary. The right shows the connections from the steering wheel to the road wheels. The movement of the rod R caused by turning the wheel drags the drag link either forward or backward, this swings one knuckle and since the other is connected by the tie rod it turns also. The turning of the knuckles causes the wheels to turn also, as is evident



IF IT has been determined previously that the motor needs overhauling, the first step is to get a quantity of supplies. It happens always in tearing down a motor that small parts such as washers and nuts become lost. Then again cotter pins are broken and gaskets torn or otherwise injured. It follows that a supply of these parts should be procured before any attempt is made to disassemble the motor.

With the spare parts and tool kit checked up, the next step is to get some clean cloth, as much of it as possible, and a big box, one capable of holding all the motor parts. It is considered advisable sometimes to use, instead of one big box, three or four small ones. Since the motor parts are thrown into the boxes they may be more easily segregated if a number of containers are used. Everything is in readiness for the disassembling of the motor, provided the oil, gasoline and water have been drained.

A very wise step, although not entirely necessary, is to remove the fenders, for then work around the motor becomes much easier. If the fenders are removed they should be wrapped with cloth and placed in a corner where they are not liable to be scratched.

Removing Connections

Remove all connections to the motor from outside sources. The spark and throttle levers should be disconnected, as well as the water hose connection to the radiator and pump, if any. In disconnecting the throttle and spark levers the point of disconnection should be that point where the rod joins the carburetor or magneto and not at the bottom of the steering post. In other words, leave as much unnecessary material as possible on the chassis, for then there are less parts to assemble later. When the clevis pins which hold usually the spark and throttle rods are taken off, they should be slipped into position on that part of the mechanism remaining on the chassis. The cotter pin should be put in place. The reason for this is that it relieves one of so much work later, in finding a place for the clevis. You do not want to have any parts left over when the job is complete. The hose connections of the radiator should be left on the radiator, for later one may wonder where the part belongs. Now, the motor is disconnected from the chassis save for the suspension points and clutch end. Disconnect the gasoline pipe from the carburetor and the wires from the spark plugs, but not from the magneto. Before removing any of the other ignition or lighting wires put a tag on the wire telling what it is and where it belongs. You might say, "Oh! I'll remem-

Hints on Motor Overhauling

ber," but you won't. Confusion results later if wires are not marked. With all outside connections away from the motor and as much material as possible attached to the chassis end, the motor proper is to be taken apart.

The carburetor should be removed. The nuts that hold the header in place should be left on the cylinder. That is, take the header off and then screw the nuts back on the studs on the cylinder. If the carburetor header is clamped on, replace the clamps and the nuts that hold them. In this way the operator will not have to look around later for these parts.

Handling the Magneto

Next remove the magneto. Usually a clamp holds this in place and the clamp is operated by a wing nut. Sometimes the fastening is by rods and nuts. These nuts are underneath the web of the crankcase. Slip the magneto out of position, being careful not to drop the coupling. The reason for this is, that the coupling should be put back in the same position as it was before removal. There are many different types of couplings, each removable easily. Place the magneto in the wooden box and cover it with a piece of cloth.

Now with the carburetor and ignition apparatus out of the way, the water pump, if any, and possibly a governor are to be removed. Bolts and nuts are employed to hold these parts in place.

In removing the exhaust pipe leave the copper asbestos gasket, usually used, together with the bolts and nuts that hold the pipe, on the chassis end. All that remains on the chassis now, is perhaps an air pump, oil pump and fan. The fan is held by a bracket usually, and the bracket held in place by small nuts. Loosen the nuts and the bracket will drop. Then the belt will loosen. Take off as little of the fan mechanism as possible. The only reason for removing this is to have room enough to take off the forward cylinder or set of cylinders. If this can be done without removing the fan and its adjuncts, then much time is saved. There is on some motors a metal water pipe between the cylinders. Remove the nuts that hold it and after removing the connecting pipe put the nuts back on the cylinder. Take from the motor the oil and water pumps. It should be remembered that each make of motor is different and to go into detail with each make would make an infinitely long story.

The cylinders are all that remain above the crankcase. These are held down by bolts and lock nuts. Straddle the frame of the car when removing the cylinders,

being careful after the cylinders are off that the pistons do not fall over against some metallic part. To do this jerk the cylinder back and forth and when it is off almost tend to push the pistons to the right. Now if you bend your right knee the piston will hit against it. This is difficult to do for one man. If help can be obtained it is best to do so. Place the cylinders in the box and screw the nuts back on the crankcase.

Leave the cylinder gaskets on the motor. For a later inspection of the crankshaft and connecting rod bearings, the cover of the oil reservoir should be removed. To do this one must get under the car and take off a number of nuts and washers. With all these removed tap the cover gently with a hammer to loosen it. It drops down easily. Put the nuts and washers back on the studs in the crankcase. Here and in all cases give the nut just one turn, or just enough to keep it on. The motor now is free of everything except the pistons, connecting rods and crankshaft, and is ready for inspection.

Inspecting the Parts

The pistons should be removed and fitted into their respective cylinders. If there is an undue amount of side play the pistons are worn excessively. The amount of play or clearance is usually .004 inch but the figure varies with the different types of motors. The rings should be free in their guides and yet not show any play up or down. Remove the rings and clean the guides well. Take each connecting rod separately and pull upward and push downward and feel for play. Feel for side play at the lower end. There should be no play in the lower bearing. In the Ford, however, a little play is allowed at the lower end because the upper end is held rigid. If the bearings show play they should either be tightened or scraped-in. Try to move the crankshaft backward, forward, upward or downward. Grasp it wherever you can get a good hold and pull and push as hard as possible. There should be no play in any direction. If there is, it is due usually to the bearings ends being flattened. This may be overcome by peining the end of the bearing or replacing the bearing.

The valve spring should be straight and all of the same size. Place the spring on the bench upright and note if the spring is distorted. Examine the valves carefully to see that the stems are straight. Fit each valve in its guide and note if there is any side play. The cost of new valves of springs is not very great and the replacement of these parts with new ones goes a long ways toward making the motor do better work later.

The Accessory Corner

New Stanweld Rim

A NEW demountable rim has been announced by the Standard Welding Co., Cleveland, O., known as the series 60. This rim will appear in two forms called respectively the 61 and 62, the former being for straight side tires and the latter for clinchers. This series has endless side rings mounted on a collapsible inner band whose ends lock with a toggle-lock. The ease with which this lock is opened and closed is a feature of the new rim.

The Stanweld series 60 is composed of the fellow-band which is shrunk on the

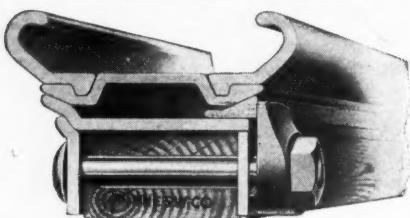


FIG. 1—NEW CLINCHER TYPE STANWELD RIM

wheel, the collapsible inner band, which is grooved to hold the flanges, the wedge ring which holds the inner band on the wheel, and the demounting parts which consist of six clamps fitted onto bolts attached to the wheel felloe.

The collapsible inner band is grooved at both sides of the top to hold the legs of the side flanges. All the parts are so fitted as to provide a smooth level surface for the tire to rest upon. The inner band is split near the valve stem hole and each end is provided with a portion of the toggle-lock. This lock is opened with a screwdriver and locked by pressure with the foot.

The side flanges are made of cold-rolled steel and are said to be lighter in weight than ordinary side flanges. The wedge ring is such, it is claimed, that all lateral movement resulting from radial pressure is eliminated. The method of unlocking the toggle-lock is shown in Fig. 2 and the



FIG. 2—UNLOCKING TOGGLE-LOCK ON NEW STANWELD RIM

clincher and straightside types of the new series in Figs. 1 and 3, respectively.

Sharrer One-Hand Top

Going a step farther than the one-man top, the Sharrer top, made by the Sharrer Patent Top Co., New York, is claimed to require but one hand for manipulation and the operator need not leave the car. This top is attached to the car at but two points, one on each side of the rear seat as the illustration in Fig. 5 shows. The Sharrer top has a framework of steel tubing and ash and the fabric either craventte, pantasote or waterproof mohair, and either Collins or Jiffy curtains may be used. When extended the top is supported by an invisible cable attached to the intermediate bow of the rear half and running over two pulleys on the forward main bow and thence to the bow of the forward extension. The top is made in all styles.

Nyco Accelerator for Fords

The New York Coil Co., New York, has introduced a fuel-saving device for Ford cars under the name of Nyco accelerator, whose main feature is that it supplies extra air to the carburetor at speeds of over 10 miles per hour. It is claimed that the attachment of this device affects a

saving of 25 per cent in fuel. The device consists of a hollow steel chamber $\frac{1}{4}$ inch thick and which is made to register with the intake pipe and mixing chamber, as shown in Fig. 7. One end conforms to the shape of the carburetor flange, while the other end extends beyond the flange and contains a valve.

Air passages are formed in this valve in such a manner that when valve is unseated by means of a steel wire running to a foot pedal located in rear foot board, air is admitted to the inlet pipe connection. The valve is supported on a rod,

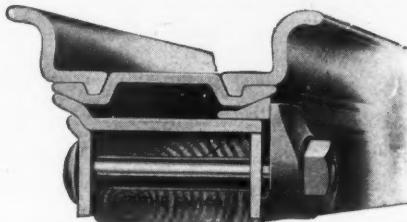


FIG. 3—STRAIGHT-SIDE TYPE STANWELD RIM

which is carried by a valve guide on the opposite side of instrument. Two springs of different sizes are employed, the first a light spring to keep the valve normally seated, the second a heavier spring, which comes into play only when the pedal is depressed more than normally when a hill is to be descended, in which condition the device allows the cylinders to completely fill with pure air, making the motor act as a brake. The price of the Nyco accelerator with foot pedal is \$5.

Russ Oxygen Carbon Remover

With carbon removing by the oxygen method coming into wide use, another maker has invaded the field with a tank attachment for doing this kind of work. The Russ outfit is the name of the latest and the Stewart Auto Accessories Co., Chicago, the selling agent. The feature

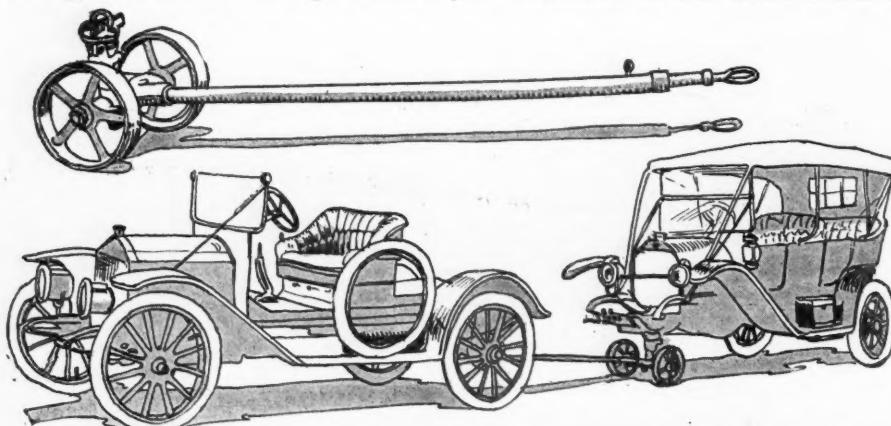


FIG. 4—WEAVER MOTOR CAR AMBULANCE AND METHOD OF ATTACHMENT

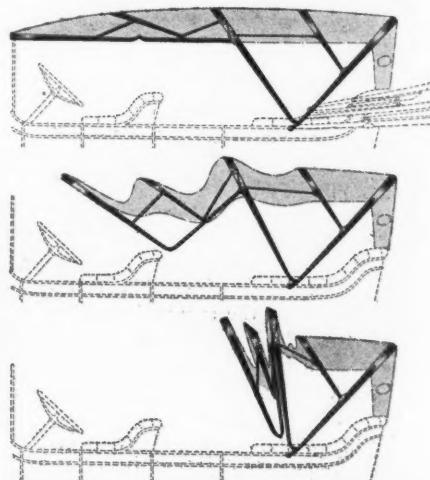


FIG. 5—SHARRER ONE-HAND TOP

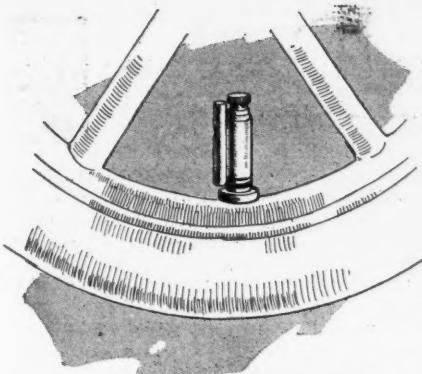


FIG. 6—POLO TIRE ALARM

of the Russ attachment is that it incorporates an expansion chamber and this in conjunction with a reducing valve, makes for economy and a steady flow of oxygen, it is claimed. Three types of apparatus are offered, one at \$22.50, shown in Fig. 9; another at \$18, which is not equipped with the reducing valve, and another at \$27.50, which has a reducing valve and a tank-pressure gauge as well as a line gauge. The prices quoted do not include the tank.

Anchor Spark Plug

The Szel Import & Export Co., New York, is offering an old type of spark plug called the Anchor plug, which is claimed to be soot-proof and self-cleaning. This plug shown in Fig. 10 has a nickel electrode shaped like an anchor, the sparks jumping from the anchor ends to the body of the

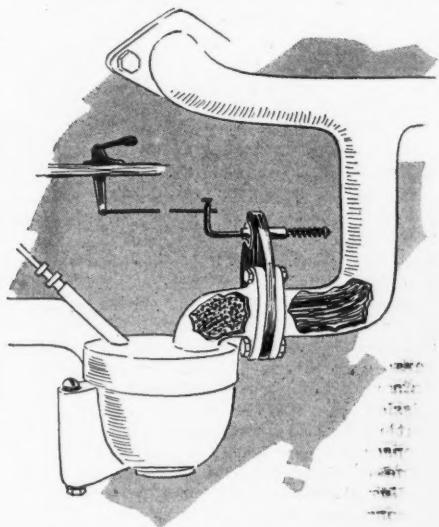


FIG. 7—NYCO FORD ACCELERATOR

plug. It is claimed that any oil which makes its way to plug will deposit and burn on the oil protector at the bottom of the body.

Polo Pneumatic Alarm

When the air pressure in a tire fitted with the Polo alarm drops to a point where it will injure the tire, a loud, shrill whistle is given off, it is claimed by the maker, the Polo Pneumatic Alarm Mfg. Co., Clear Lake, S. D. The alarm supplants the dust cap of the ordinary tire valve, as shown in Fig. 6. Different size tires require different types of alarms, as

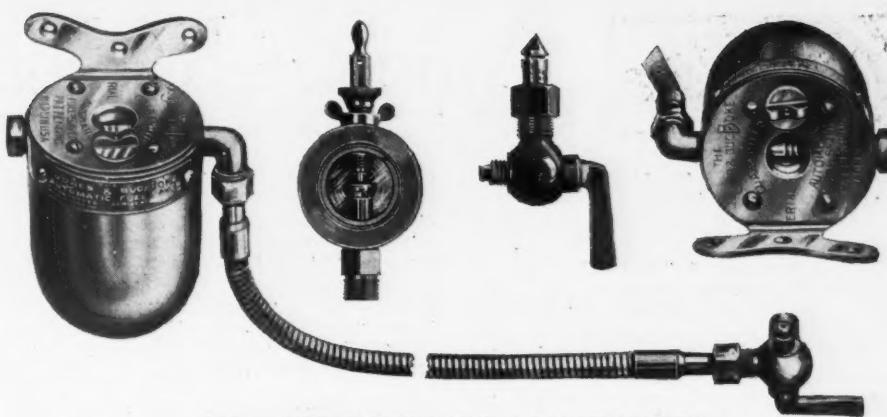


FIG. 8—THREE TYPES OF J. & B. FUEL SAVERS

the minimum working pressure varies with the size. The Polo alarm is made of brass and sells for \$8 per set of four.

Weaver Ambulance

The Weaver Mfg. Co., Springfield, Ill., has brought out an emergency truck, known as the Weaver Ambulance, with which, it is claimed, one man is capable of towing in a disabled car. The truck and one method of using it is illustrated in Fig. 4. The feature of this truck is the ease with which it may be attached and removed. Besides being used as shown in the illustration the truck may be made to take the place of one wheel. The tongue or rod-like portion is adjustable to meet requirements. The maker lists the ambulance at \$30.

J & B Fuel Saver

Giving extra air to the motor automatically and when it is needed is said to be accomplished by the J & B Fuel Saver manufactured by Jones & Buckoke,

Chicago. The saver is made in three types illustrated in Fig. 8. One type is shown at the extreme left. This sends not pure air but a mixture of gasoline and air to the cylinders and is claimed to increase motor efficiency considerably. The valve shown taps the intake manifold. The bowl is filled with fuel and placed on the dash and when the apparatus is in operation the inrush of air through the bowl carries with it some gasoline and the spray enters the manifold. The operation is automatic and is governed by engine speed. The fuel saver shown next is placed on the dash and sends only extra air to the intake manifold, through a pipe attached to the threads shown. The wing nut is a lock which permits the device to be connected and disconnected at will. The third saver is simply an extra valve screwed into the

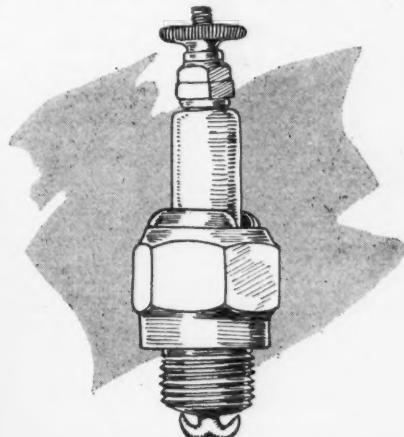


FIG. 10—ANCHOR SPARK PLUG

intake manifold and controlled by a cock. For country work the valve is opened and then extra air is taken into the cylinders as the engine speed dictates. At the extreme right is shown the top of the bowl.

Traut & Heine Gasoline Gauge

A novel gasoline gauge has been brought out by the New York firm of Traut & Heine. It is of the dipping type and the feature is that it will show the level of fuel 5 minutes after the gauge has been removed from the tank. This is accomplished by a special compound with which the metal gauge is coated. The gauge may also be used as a Prest-O-Lite key.



FIG. 9—RUSS OXYGEN CARBON REMOVER



Among the Makers and Dealers



RUBBER Factory for Sherbrooke, Que.—The Panther Rubber Mfg. Co. will erect a factory at Sherbrooke, Que., in the near future.

Seattle Company Building 1-Ton Truck—The Star Carriage Co. of Seattle, Wash., has commenced the manufacture of the Northwestern 1-ton truck. J. G. Eyler and August Geyerblehl, the inventors, comprise the company.

State Fair Prize to Studebaker—At the recent California state fair in Sacramento, first prize for the best line of cars on exhibition went to the local representative of the Studebaker Corp., after some very lively competition.

Locomobile Sales Force Enlarged—Henry C. Biggam, formerly of the Lozier New York agency, and Leslie F. Smith, once identified with the Studebaker Corp. and Oakland company, have been added to the sales force of the Locomobile Co. of America.

Gold Medal for Franklin—At the North Carolina state fair held at Raleigh recently the new Franklin 6-30 won the first premium gold medal. The prize was awarded in competition with a number of 1914 models and was based on appearance, efficiency, ability and value for price.

Penn Plant May Be Reopened—The \$90,000 plant of the defunct Penn Motor Car Co., near New Castle, Pa., which has been idle for several months, may soon be reopened. Former Sales Manager E. B. Gregg has obtained a 30-day lease to the works and says that within a few days he expects to have a buyer for it.

Rain Coats for Factory Builders—Inclement weather will not stop construction work on the new addition to the Thomas B. Jeffery Co. plant now being built at Kenosha, Wis. Rain coats have been purchased and given to the 200 workmen who are laboring at high speed in order that the factory, which will have 2½ acres of floor space, will be ready for occupancy December 5.

Establish Nine New Factory Branches—The Stewart-Warner Speedometer Corp., by establishing recently new offices at Philadelphia, Pittsburgh, Atlanta, Portland, Los Angeles, Kansas City, Minneapolis, Cincinnati and St. Louis, has increased the number of its direct factory branches from eight to seventeen. Fifty-three service stations are already in operation and it is the plan of the company to increase this number to one hundred.

Jeffery Income Tax Roll Heavy—The income tax roll of Kenosha corporations, just filed by the state tax commission, shows the Thomas B. Jeffery Co. to be one of the three largest income taxpayers in Kenosha. A tax of \$13,655.96 is levied against the Jeffery company on its 1912 income, payable at the beginning of 1914. The Badger Brass Mfg. Co. of Kenosha, maker of Solar lamps, is listed on the tax roll as being required to pay \$3,303.12 on its net income for 1912.

Columbia Plant on the Market—All machinery in the Columbia Motor Car Co. plant at Hartford, Conn., has been removed to Newcastle, Ind. The Columbia Auto Repair Co. now occupies the repair shop on Park street and John J. Roach is making use of the paint shop pending the completion of a new building on Maple avenue. This week the Britton company purchased all the materials on hand in the big trimming department and removed them to the Allyn street shop. A local electric battery charging station has acquired all the battery fittings

and accessories. The big plant is now on the market. There seems to be no immediate prospect of sale.

Warren Gets Standard Truck Plant—Arrangements have been completed which will result in the removal of the Standard Automobile Co. of Cleveland, manufacturer of light trucks, Warren, O. The Warren board of trade has an option on the Lyman property, which seems to be a satisfactory location.

To Manufacture Airless Tire—Frederick C. Felker of Racine, Wis., inventor of a new type of airless tire for motor vehicles, is planning to engage in the manufacture of the device, having refused an offer for \$15,000 for the patent rights. The invention provides a tire of a cellular inner structure which in event of puncture will not be entirely disabled. The affected cell will collapse, while the adjoining cells expand to

TWO CONVICTS WRITE FOR MOTOR CAR CATALOGS

*W*HEN a man is allowed just one sheet of letter paper each month, in which to convey his dearest wish to the outside world, of which, for a time, he is no longer an active part, he may be expected to concentrate on this message all the result of long deliberation. That is exactly the condition faced by many an inmate of the federal or state prisons. One letter a month is the standard rule and even this is conditioned on good conduct.

*I*magine, therefore, the genuine interest which must prompt a man, so situated, to make use of this monthly sheet of paper to write a motor car manufacturer for a copy of his latest catalog.

*N*ot one, but two cases of this sort have come under the notice of the Studebaker correspondence staff, since the recent announcement of the new models. In the Fort Leavenworth, Kan., military prison, the Studebaker announcement reached the eye of prisoner No. 3945. He took his lone sheet of paper and made his October message to the world outside a request for information on the 1914 models. The same announcement found its way into the cell of inmate A7559 in the western Pennsylvania state prison at Pittsburgh, north side. He, too, used his monthly sheet of letter paper to make a similar request. Unlike that of the Fort Leavenworth recluse, the Pittsburgh man's letter was more than a formal request.

*"P*lease send me at your earliest convenience," ran the opening line, in the tone of a man whose time is valuable and whose impatience rises at the very thought of delay. And with, "By so doing you will oblige, very respectfully yours," he closed.

*W*hether or not No. 3945 at Fort Leavenworth, and No. A7559 at Pittsburgh, ever will be able to enter the market as active motor car buyers is a matter which their correspondents never will know. What they do know, however, is the fact that each of these men harbors deep down in his heart, despite the cold walls which hide him away, the hope that he may again be free and may enjoy that liberty to the full, at the wheel of his own car.

take its place. There is provided a common means for inflating the several cells with a valve mechanism which will automatically close to prevent loss of air by uninjured cells in event of puncture.

Metal Plant for Toledo—The General Metal Work Co., at present operating in Jersey City under the name of the Miller Metal Work Co., is expected to transfer its plant from that place to Toledo, O., by January 1. The company manufactures the tubular parts of motor cars.

Takes Charge of Western Sales—As the result of a general reorganization scheme of the field men of the Hudson Motor Car Co., Detroit, Percy D. Stubbs, assistant sales manager, left for the coast last week to take complete charge of the Hudson sales west of Salt Lake City.

Dissatisfied Owner Loses Suit—Judge J. M. Becker, Monroe, Wis., lost his suit in the civil court at Milwaukee against the F.-S. Motors Co., formerly the Petrel Motor Car Co., for the recovery of \$972.80. The testimony showed that Judge Becker purchased a car from the Petrel company but that it proved unsatisfactory and immensely troublesome from a mechanical standpoint. He sued for the return of the purchase price and cost of repairs. The civil court found for the defendant. Judge Becker appealed the case to the higher court.

Thomas Designer with Lyons-Atlas—The Lyons-Atlas Co. of Indianapolis, maker of the Lyons-Knight cars, announces the appointment of Frederick P. Nehrbas as factory manager for the E. R. Thomas company in Buffalo and from August 1, 1911, until the suspension of the Alco plant at Providence, he occupied a similar position there. Nehrbas designed the Thomas champion that won the New York to Paris race several years ago. Harry Tuttle, special representative of the Lyons-Atlas Co., has gone to the Pacific coast to establish agencies in the far west.

Enforcing New Garage Law—As a result of investigations made by its inspectors in looking up accident cases, the Massachusetts highway commission has started a crusade to enforce the garage record law. This law reads that every time a car enters or leaves a garage it must be recorded with the time and the signature of the driver. Many garages have not paid any attention to it. As a result of what it has learned, the commission has warned a number of garages that unless the owners obey the law their licenses to operate cars will be revoked. Some of them have been in the habit of lending their number plates to unauthorized persons, too, and this has been ordered stopped.

New Blood for Haynes Company—Preparatory to increasing its production to 5,000 cars, the Haynes Automobile Co. of Kokomo, Ind., continues to augment its technical and sales forces. The services of R. C. Hoffman, who was until recently identified with the J. I. Case Threshing Machine Co., Racine, Wis., has been secured. Mr. Hoffman becomes chief draughtsman of the Haynes company. Other representatives are: L. C. Burnett, the new district sales manager in northwest territory, with headquarters in Minneapolis, who comes from the Peckham Motor Car Co. of Dayton, O., of which company he was secretary and general manager; F. A. Fisher, at one time identified with the eastern Canada distributors of the Stutz car, becomes the Haynes district sales manager in the same territory, with head-

quarters at Toronto; while J. S. Stark, a recruit from the Michigan Buggy Co., will henceforth represent Haynes in the Hoosier state, with headquarters at Elkhart.

Lincoln Gets Typhoon Factory—The Typhoon Signal Co. has moved its main office and plant from Chicago to Lincoln, Ill., where it has a factory with 50,000 feet of floor space.

Stromberg Moves Eastern Branch—The eastern branch of the Stromberg Motor Devices Co. has been moved from 146 West Fifty-sixth street to a new location between Sixth and Seventh avenues, New York.

More Power for Tire Plant—The Pennsylvania Rubber Co. at Jeannette, Pa., has the foundations in for its new power plant which will cost \$130,000. The work is under the supervision of the W. G. Wilkins Co., of Pittsburgh.

Charges Patent Infringement—Grant F. Discher, president and general manager of the Garage Equipment Mfg. Co. of Milwaukee, has filed suit in the federal court at Milwaukee against the Milwaukee Auto Specialties Co. on charges of infringement of patents on brackets for bumpers or protecting guards. Mr. Discher is suing for an injunction and an accounting.

Feilbach Capital Stock Increased—The Feilbach Motor Co. of Milwaukee, manufacturing motors and motorcycles, has increased its capital stock from \$50,000 to \$100,000. The concern is building a new plant at the northern city limits of Milwaukee and on January 1 will quadruple its capacity. Until now the concern has occupied the Stegeman Motor Car Co.'s former commercial vehicle factory at 1148-1154 Holton street, Milwaukee.

Fire Destroys Stamping Factory—The plant of the Racine Metal Stamping Co., Racine, Wis., which furnishes stampings to the motor car and other industries of Racine, was destroyed by fire and explosion, causing a loss of \$25,000. The building was totally wrecked. The principal loss was on machinery, equipment, patterns, dies, etc. A new fireproof factory will be erected at once. A. Falkenrath and Jerome Ritter are the principal stockholders.

Moving into New Foundry—The Wisconsin Aluminum Foundry Co. of Manitowoc, Wis., a large producer of motor car engine castings, is moving into its new foundry plant at South Sixteenth and Franklin streets, Manitowoc. The new plant makes it possible to more than double the production. The equipment is new throughout. The site of the plant was donated by the Manitowoc Citizens' Association and is large enough to make possible extensive additions when needed.

Lozier Sales Conference Next Week—A sales conference of the Lozier dealers has been called for November 17 and 18 at the company's office in Detroit by Sales Manager Paul Smith. Present indications lead to the belief that this will be the largest attended meeting of the kind yet held by the Lozier company. The new four-cylinder model will be unveiled at this time and the dealers given demonstrations of it on the roads around Detroit. A large production of this new four is contemplated.

To Build Light Motor Car—Plans are under contemplation for the building of a light car in Worcester, Mass., and work upon it may start shortly. Frank O. Woodland has received patents on the parts and is interesting some Worcester men to join him in the enterprise. His patents cover a two-cycle motor; also a rolling clutch transmission and a shock absorber. Now he is working on spring wheels. All of these will be embodied in the new car, which is to be a light, low-priced model. As much of the machinery used by motor manufacturers

Coming Motor Events

SHOWS, CONVENTIONS, ETC.

November 7-15—Olympia show.
November 8-15—Atlanta show.
November 10-15—United States Good Roads Association, St. Louis, Mo.
November 20-22—Alabama Good Roads Association, Mobile, Ala.
December 6-13—Show, Toledo, O.
December 9-12—Annual convention of American Road Builders' Association, Philadelphia.
December 11-20—First International Exposition of Safety and Sanitation, New York city, American Museum of Safety.
January 2-10—Importers' Automobile Salon, Hotel Astor, New York.
January 3-10—New York show, Grand Central palace.
January 4-8—S. A. E. meeting, New York.
January 10-16—Milwaukee, Wis., show.
January 10-17—Philadelphia show.
January 10-17—Show, Cleveland, O.
January 10-21—Show, Brussels, Belgium.
January 12-17—Show, Bridgeport, Conn.
January 24—February 7—Show, Montreal Can.
January 24-31—Rochester, N. Y., show.
January 24-31—Chicago show.
January 26-31—Scranton, Pa.
January 31—February 7—Minneapolis show.
February 2-7—Buffalo passenger car show.
February 9-14—Buffalo truck show.
February 16-21—Kansas City show.
February 18-21—Bloomington, Ill., show.
February 21-28—Newark, N. J.
February 22—March 5—Cincinnati, O.
February 23-28—Omaha show.
February 24-27—Show, Bloomington, Ill.
March 2-6—Show, Ft. Dodge, Ia.
March 7-14—Boston passenger car show.
March 9-14—Show at Des Moines, Ia.
March 17-21—Boston truck show.

CONTESTS.

May 30, 1914—Indianapolis 500-mile race.

comes from Worcester, it is expected that it would not be a difficult task to start building in short order.

Ewing Files Bankruptcy Petition—L. L. Ewing, of Cleveland, O., motor car manufacturer, has filed a voluntary petition in bankruptcy in the federal court, giving liabilities of \$390,540 and assets of \$400. The liabilities include \$190,000 due the creditors of the Findlay Motor Co.

Brown Joins Cole Sales Force—The appointment of Will H. Brown as sales manager of the Indianapolis sales branch of the Cole Motor Car Co., has been announced and in his new position Mr. Brown will direct the sales of the Cole company throughout Indiana and Ohio. Mr. Brown will continue his connection with the Brown Commercial Car Co. of Peru, Ind.

Republic Takes Over New York Branch—In line with its policy of establishing direct selling connections, the Republic Rubber Co. of Youngstown, O., has acquired control of the Republic Rubber Co. of New York, formerly owned and managed by New York people. F. G. Hill, secretary and sales manager of the old company, will continue in the same capacity in the new organization.

Truck in Long Alaskan Trip—A Federal truck recently made a trip from Winnipeg to Regina, Saskatchewan, a distance of 464 miles, in 42 hours of running time, with a load of 7,500 pounds. The cargo consisted of bed springs and mattresses. Four days were consumed in the run, the average daily mileage being 116 miles. The road conditions were extremely bad during most of the trip, a great many sand hills and sandy stretches being encountered, especially around Carberry. From Moosomin to Greenfell there are practically no roads, so that the truck had to pass through trails and cross sloughs where planks were laid to keep the vehicle

practically free from water. It was not found necessary to make adjustments during or after the trip.

Two Milwaukee Plants Idle—Two large Milwaukee motor car plants are idle during the disposition of bankruptcy proceedings. Neither the plant of the Milwaukee Motor Co. at Thirty-first and Burleigh streets nor the commercial vehicle plant of the Stephenson Motor Truck Co. at South Milwaukee is being operated. Both plants are valuable properties, but the bankruptcy litigation prevents the wheels from being turned, as creditors made no effort to have them operated as going concerns until final disposition is made.

Roadsters for Kenosha Chiefs—Charles T. Jeffery, president and general manager of the Thomas B. Jeffery Co. of Kenosha, Wis., has made another donation of equipment for the Kenosha fire and police department. Two Jeffery roadsters have been presented to the city, one for the use of the fire marshal and the other for the use of the chief of police. Mr. Jeffery and his late father, Thomas B. Jeffery, have provided the two departments with motor-driven equipment of all kinds, and the latest gift has the effect of completely motorizing the Kenosha public safety and protection system.

James Pass Dies at Syracuse—James Pass, a prominent business man of Syracuse, N. Y., and one of the original incorporators of the H. H. Franklin Mfg. Co., died October 30 at his home in Syracuse. In 1894, after H. H. Franklin had been manufacturing die castings for 1 year in Syracuse, Mr. Franklin bought out his partner, Mr. Underwood, and formed a co-partnership with four others, one of them Mr. Pass. Within the next year the H. H. Franklin Mfg. Co. was incorporated. At the end of another year Mr. Pass withdrew from the company to concentrate on his own companies, the Onondaga Pottery Co. and Pass & Seymour.

Indianapolis Abandons March Show—At the annual meeting of the Indianapolis Automobile Trade Association it was decided to abandon the annual March motor car exhibit and instead, some time in February, observe an opening week. This is the plan that was followed until this year. Each dealer will exhibit in his own establishment. However, there will be a number of public events and merchants will be asked to decorate their places of business. At the meeting L. L. Banford, B. M. Wylie and R. P. Henderson were unanimously elected directors to succeed themselves. There was a chicken dinner at the Indianapolis Canoe Club in connection with the annual meeting.

Canada Has Motor Car Boom—Over 12,400 more motor vehicles were in use in the Dominion of Canada on November 1 than at the end of last year, according to figures compiled by the Automobile Club of Canada. It is rather remarkable that the largest gains among the motor vehicle using provinces were made at the two ends of the continent—in New Brunswick and the Yukon, where the increases were over 300 per cent. According to the A. C. of C. poll, there are 44,278 motor vehicles in Canada this year compared to 31,865 listed in 1912. The increase over last year, according to provinces, is as follows: Quebec, 1,109; Ontario, 3,316; New Brunswick, 500; Manitoba, 1,073; British Columbia, 2,333; Nova Scotia, 433; Saskatchewan, 2,771; Alberta, 805; Yukon, 10.

New Maryland Tire Maker—The Dreadnought Tire and Rubber Co. has been incorporated under the laws of Maryland at \$1,000,000 for making motor car tires. Operations of the firm's new plant at Orangeville, Baltimore county, will begin January 1. At the start the firm will employ 150 to 200 men and put out 300 tires and 300 inner tubes daily and gradually increase this number.



Brief Business Announcements



BOSTON, Mass.—The King Motor Car Co. of Detroit has opened its salesrooms at Springfield, Mass., at 521 Worthington street. William Vincent is in charge.

Columbus, O.—The entire second floor of the building at 241 North Fourth street, occupied by the Gaither Automobile Co., has been remodeled into a repair shop.

New York—The Bosch Magneto Co. announces the appointment of the following distributors: Bertram Motor Supply Co., Salt Lake City and Schuman Carriage Co., Honolulu.

Alliance, O.—The Firestone Auto Co., which has been located at the corner of Arch and Oxford streets, Alliance, O., has been consolidated with the Alliance Motor Car Co. at 32 East Main street.

Green Bay, Wis.—Jules Gerard of Green Bay, Wis., agent for the Cadillac, has decided to retire from business and has sold the agency business to the Green Bay Motor Car Co., which also takes over the garage equipment and will use it for enlargement of its own place of business.

Connellsville, Pa.—The Connellsville Garage, formerly conducted as a partnership composed of V. J. Clark and William Work, has recently changed hands. Mr. Work disposing of his interest to W. D. McGinnis and J. L. Evans. Incorporation papers have been applied for and stock will be issued to the amount of \$30,000, which is fully paid. The capacity will be increased from 50 to 125 cars.

Green Bay, Wis.—The Lucia Bros. Motor Car Co. of Green Bay, Oconto and Depere, Wis., one of the largest distributors and garage concerns in northeastern Wisconsin, has disposed of its branch house at Oconto to Sophus Nelson, who will continue the business. The recent death of Albert Lucia made it necessary for W. H. Lucia, in charge at Oconto, to go to the main house at Green Bay

to assist Howard Lucia. Mr. Nelson came from the Peerless shops in Cleveland several years ago to take charge of the mechanical department of the Lucia business.

Hillsboro, O.—Miller & Sauner, of Mowerytown, O., have leased the Carroll building in Hillsboro, O., and will open a garage as soon as the structure can be remodeled. It will be known as the Hillsboro Auto Co.

Fox Lake, Wis.—W. H. Murphy is building a garage here on a lot across from the Fox Lake hotel. Mr. Murphy plans to take the local agency for two popular makes of cars.

Boston, Mass.—Forest H. Peabody, for 8 years assistant to Manager Charles E. Fay of the Boston branch of the Ford Motor Co., has been made manager of the Ford branch at Louisville, Ky.

Seattle, Wash.—The William T. Patten Motor Car Co. of Seattle is now in new quarters at Tenth and Pine streets, distributing Hupmobile and White cars. Captain William T. Patten, U. S. A., retired, and Arthur H. Hertz form the company.

Indianapolis, Ind.—C. C. Marble has sold his tire and vulcanizing business in Indianapolis to the Culbertson Rubber Tire and Vulcanizing Works. The Indianapolis sales branch of the Rauch & Lang Electric Auto Co. has been moved from 531 North Capitol avenue to 3011 Central avenue, in the North Side Garage.

Milwaukee, Wis.—The Wisconsin State Rubber Co. has been organized by Harold D. Detienne to establish a general rubber goods business and handle tires and accessories. Mr. Detienne until now has been associated with the Milwaukee branch of the Goodyear Rubber Company, which suffered a \$360,000 loss by fire on October 26. His father-in-law, W. W. Wallis, was manager of the Milwaukee branch until his death last Jan-

uary. Mrs. Wallis and Mrs. Detienne appear as corporators with Mr. Detienne in the organization of the new company, which is capitalized at \$10,000.

Columbus, O.—The firm name for the Columbus and central Ohio agency for the Packard has been changed from F. E. Avery to F. E. Avery & Son. The salesrooms and repair shop are located at 1199 Franklin avenue.

Cincinnati, O.—The Nyberg Auto Sales Co. of Cincinnati has filed papers with the secretary of state reducing its capital stock from \$25,000 to \$7,500 and at the same time changing its name to the Queen City Garage and Repair Co.

Green Bay, Wis.—The Fox River Valley Motor Car Co. of Green Bay, Wis., district agent for the Ford, has leased the Hoberg building at 415-417 Main street and will equip it as a salesroom, public garage and service station. The new tenants will take occupancy January 1. Charles W. Collier is general manager.

Tomah, Wis.—A. C. Velton and son, A. C. Velton, Jr., of Detroit, Mich., have leased the former works of the Tomah Mfg. Co. at Tomah, Wis., and will establish a machine shop, public garage and repair shop, later taking local agencies. The senior Mr. Velton recently resigned as chief engineer and factory inspector of the Detroit Engine Works to go in business on his own account.

Cleveland, O.—The Cuyahoga Sales Co., successor to the Lozier Sales Co., and exclusive Chandler representative in Cleveland, has started a novel attraction at the sales room. The sale of the Lozier being discontinued by the company, the name has also been changed and Ray M. Colwell, manager of the company, is showing the lightweight six by means of stereopticon slides, illustrating parts of the car that the owner rarely sees.

Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Akron, O.	H. E. Kepler	Haynes	Dallas, Tex.	Sacksteder-Potter Co.	Marion
Albuquerque, N. M.	Haynes Motor Sales Co.	Haynes	Dallas, Tex.	Davis-Turney Co.	Haynes
Antioch, Ill.	Sibley & Hawkins	Jeffery	Danville, Ill.	Jones Garage	Marion
Asheville, N. C.	A. H. McCormick	Jeffery	Decatur, Ill.	F. D. Parker	Marion
Ashland, Ky.	Wright Motor Car Co.	Marlon	Decatur, Ill.	Tenney & Co.	Jeffery
Buffalo, N. Y.	Louis Engle, Jr.	Partin-Palmer	Delavan, N. Y.	Goo & Hopkins	Haynes
Bakersfield, Cal.	J. M. Dunn	Marlon	Denver, Colo.	Colorado Haynes Auto Co.	Haynes
Bainbridge, Ga.	Caldwell Motor Car Co.	Marlon	Des Moines, Ia.	Clemens Autô Co.	Marion
Bangor, Me.	P. E. Severance	Haynes	Dexter, Me.	E. D. Blaisdell	Jeffery
Baring, Me.	Edward Chase	Jeffery	Dillon, Mont.	Dillon Novelty Works	Jeffery
Beecher, Ill.	Herman Bockelman	Jeffery	Edwardsburg, Mich.	L. C. Bishop	Jeffery
Beloit, Kan.	Ed. James	Jeffery	Elgin, Tex.	Rivers Bros. Merc. Co.	Jeffery
Bellevue	The Bellevue Garage	Jeffery	Ely, Nev.	Ely Garage & Supply Co.	Cole
Birmingham, Ala.	M. A. Hines	Velle	Elwood, Ind.	Wilfred Sellers	Haynes
Birmingham, Ala.	Haynes Motor Car Co.	Haynes	El Paso, Tex.	W. F. Payne	Haynes
Bloomington, Wis.	A. H. Patch	Jeffery	Emporia, Kan.	H. L. Dwelle	Jeffery
Boston, Mass.	W. L. Russell Co.	Haynes	Elgin, Ill.	John M. Puckett	Partin-Palmer
Bradford, Pa.	Bisett Bros.	Jeffery	Evanston, Ill.	Sherland & Williams	Jeffery
Buffalo, N. Y.	F. Kleppner	Stutz	Evansville, Ind.	Boyd & Kappier	Haynes
Buffalo, N. Y.	J. A. Cramer	Jeffery	Emporia, Kan.	J. C. Burkett	Marion
Burlington, Wis.	Ed. Zweibel & Bro.	Jeffery	Fairview, Ill.	Earl Grimm	Jeffery
Bushnell, Ill.	Herring Bros.	Jeffery	Fitchburg, Mass.	Ford & Lyon	Jeffery
Galva, Ill.	Harris Bros.	Jeffery	Forsythe, Mont.	Main Street Garage	Jeffery
Caribou, Me.	W. R. Smith	Jeffery	Fort Worth, Tex.	Rambler Motor Co. of Tex.	Jeffery
Carrollton, Mo.	Wright Bros.	Jeffery	Forest Grove, Ore.	J. J. Wirtz & L. H. Watkins	Cole
Carthage, Mo.	T. V. Gribble	Jeffery	Florence, Mass.	G. H. Burnham	Jeffery
Charlotte, N. C.	United Motor Charlotte Co.	Marlon	Fond du Lac, Wis.	Fond du Lac Auto & Tire Repair Co.	Jeffery
Charleston, S. C.	Wallace K. Harley	Jeffery	Fremont, Neb.	S. A. Zapp	Hudson
Charleston, W. Va.	H. G. Nicholson	Jeffery	Galesburg, Ill.	Rambler Auto Co.	Jeffery
Chicago	Haynes Motor Car Co.	Haynes	Grand Rapids, Mich.	B. F. Kenyon	Jeffery
Chilton, Wis.	Thompson & Steffer	Jeffery	Green Bay, Wis.	Fox River Valley Motor Car Co.	Ford
Chippewa Falls, Wis.	Chippewa Valley Auto Co.	Jeffery	Green Bay, Wis.	Green Bay Motor Car Co.	Cadillac
Colfax, Ill.	H. A. Arnold	Jeffery	German Valley, Ill.	F. R. Aukes	Partin-Palmer
Columbia, S. C.	Dupre Auto Co.	Jeffery	Gonzales, Tex.	Emil Schleyer	Cole
Columbus, O.	Harry L. Haight	Studebaker	Hampton, Ia.	Roemer-Gibson Co.	Marion
Columbus, O.	Edward Miller	Premier	Haverhill, Mass.	Rambler Motor Car Co., Ltd.	Jeffery
Concord, N. H.	Norris A. Dunklee	Jeffery	Hemingford, Neb.	Frank Caha	Empire
Concordia, Kan.	Wilcox & Burnside	Partin-Palmer	Herculaneum	Dugan Lumber Co.	Metz
Crown Point, Ind.	Foss & Worsley	Partin-Palmer	Ithaca, N. Y.	J. B. Lang Eng. & Garage Co.	Jeffery
Corvallis, Ore.	Prather, Miller & Aleorn	Cole	Indianapolis, Ind.	Partin-Palmer Motor Car Co.	Partin-Palmer
Des Moines, Ia.	Partin-Palmer-Iowa Co.	Partin-Palmer	Jacksonville, Ill.	David Estaque	Partin-Palmer

Recent Agencies Appointed by Motor Car Manufacturers—Continued

PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Jamestown, N. Y.	J. L. Frick	Jeffery	Providence, R. I.	J. Edward Newton Co.	Stevens-Duryea
Joliet, Ill.	A. J. Gurney	Jeffery	Pueblo, Colo.	Knebel Automobile Co.	Jeffery
Kalamazoo, Mich.	F. W. Kanney & Son	Jeffery	Raleigh, N. C.	Raleigh Motor Car Co.	Franklin
Kankakee, Ill.	A. E. Cook	Jeffery	Red Lodge, Mont.	Draper Bros.	Jeffery
Kansas City, Mo.	Runcie Motor Car Co.	Marion	Rockford, Ill.	Lundstrom Bros.	Partin-Palmer
Kansas City, Mo.	Haynes Motor Car Co.	Haynes	Ridgeway, Mo.	J. H. Shirer & Co.	Jeffery
Kezar Falls, Me.	F. C. Palmer	Jeffery	Rochester, N. Y.	F. R. Luescher, Inc.	Jeffery
Lafayette, Ind.	Morhan & Torrenga Auto Co.	Jeffery	Rock Island, Ill.	G. T. Bradford	Jeffery
LaGrange, Ind.	Rambler Motor Co.	Jeffery	Rocky Mount, N. C.	Burnett-Chapman Supply Co.	Jeffery
Lagrange, Mo.	Crouch & Most	Metz	Rockford, Ill.	Joslyn Auto Co.	Jeffery
Lima, O.	George E. Wirt	Jeffery	Rochelle, Ill.	Dexter Stocking Co.	Jeffery
Lisbon, Ia.	N. A. York	Jeffery	Rockville, Conn.	Snow Garage Co.	Jeffery
Los Angeles, Cal.	Symonds Motor Car Co.	Marion	Rutland, Ill.	Rutland Motor Co.	Jeffery
Los Angeles, Cal.	Golden State Motor Car Co.	Partin-Palmer	Salamanca, N. Y.	Fred F. Nies	Jeffery
Lima, O.	C. H. Shappell	Partin-Palmer	Salem, Mass.	Witch City Auto Co., Inc.	Jeffery
Marlboro, Mass.	F. S. Dewey, Jr.	Cole	Salem, Mo.	W. H. Peiton	Metz
Minneapolis, Minn.	J. P. McGuire	Partin-Palmer	Salina, Kan.	Ollinger Auto Co.	Jeffery
Mobile, Ala.	Chas. R. G. Schimpf	Partin-Palmer	San Antonio, Tex.	Woodward Carriage Co.	Jeffery
McNabb, Ill.	George Ziegler	Partin-Palmer	Sanford, Fla.	Haynes Auto Sales Co.	Haynes
Mt. Morris, Ill.	Lewis Brinker	Partin-Palmer	San Francisco, Cal.	A. D. Zachary	Cole
Macon, Ga.	Geo. R. Napier	Partin-Palmer	Sheffield, Ill.	C. W. Gunkel	Partin-Palmer
Malvern, Ia.	C. B. Boles	Haynes	Stetsonville, Wis.	Martin Bros.	Chamberlin Bros.
Manistee, Mich.	Auto Garage Co.	Empire	Salem, Ore.	Sterling, Ill.	E. S. Werneke
Manhattan, Kan.	Larson & Lund	Jeffery	Sioux City, Ia.	Haynes Auto Sales Co.	Haynes
Maxton, N. C.	Maxton Auto Co.	Jeffery	Somersworth, N. H.	W. E. Fellows	Jeffery
Maxton, N. C.	Leroy B. Martin	Jeffery	South Bend, Ind.	Frazier & Frazier	Jeffery
Meadville, Pa.	H. E. Rupp	Jeffery	Spokane, Wash.	Twitchell & Schmidt	Hupmobile
Memphis, Tenn.	Wright Motor Car Co.	Jeffery	Springfield, Vt.	Chas. S. Russell	Jeffery
Michigan City, Ind.	Reeke-Osmond Motor Car Co.	Jeffery	St. Louis, Mo.	W. M. Peiton	Metz
Milwaukee, Wis.	W. J. Geiger	Cole	St. Louis, Mo.	Brinkman Auto Co.	Lyons-Knight
Minneapolis, Minn.	Northwest-Haynes Auto Co.	Haynes	St. Clair, Mo.	C. F. Nierheiser	Haynes
Montreal, Que.	Jackson Motor Co.	Jackson	Tacoma, Wash.	G. R. Green Motor Car Co.	Maxwell
Montreal, Que.	J. A. Charette	Haynes	Tacoma, Wash.	G. R. Green Motor Car Co.	King
Montreal, Que.	Simeon Gagnon	Jeffery	Tiffin, O.	Wingert & Miller	Partin-Palmer
Mt. Vernon, O.	Jay R. Clutter	Jeffery	Tampa, Fla.	L. F. Hayes & Co.	Jeffery
Muncie, Ind.	M. V. Bartlett	Marion	Terre Haute, Ind.	West Coast Automobile Co.	Cole
New Castle, Ind.	O. H. Broadway	Marion	Thomasboro, Ill.	Fledder Bros.	Jeffery
Normal, Ill.	Harris & Herr	Partin-Palmer	Toronto, Ont.	Standard Motors, Ltd.	Jeffery
Newhall, Ia.	Charles Grovert & Son	Jeffery	Upper Alton, Ill.	O. Reausseau	Haynes
New Haven, Conn.	D. E. Currie	Jeffery	Upper Alton, Ill.	O. Reausseau	Metz
New York	Haynes Auto Co.	Haynes	Urbana, O.	Stanley Filler	Cole
Nokomis, Ill.	F. J. Pannitt & Son	Jeffery	Vancouver, B. C.	Archibald Auto Co.	Haynes
Neenah, Wis.	C. H. Bergstrom	Cole	Victoria, Tex.	L. G. Kreisle	Haynes
North Battleford, Sask., Can.	Lane Bros.	Cole	Victoria, Tex.	E. E. Pickering	Cole
Omaha, Neb.	Traynor Auto Co.	Partin-Palmer	Warren, Pa.	F. W. Douglas	Partin-Palmer
Ohio, Ill.	Alfred Johnson & Son	Partin-Palmer	West Frankfort, Ill.	Smith & Blake	Partin-Palmer
Oconto, Wis.	Sophus Nelson	Chalmers	Warsaw, Ill.	M. C. Eckbohm	Empire
Ogdensburg, N. Y.	Percy W. Dawley	Jeffery	Wahoo, Neb.	Stalver Hanson	Jeffery
Oshkosh, Neb.	Tucker Bros.	Empire	Warren, Pa.	Newmaker & Reed	Marion
Parnell, Mo.	Roof & Gray Auto Co.	Partin-Palmer	Washington, D. C.	Cunningham Motor Co.	Jeffery
Pontiac, Ill.	D. B. King	Partin-Palmer	Waterbury, Conn.	H. M. Turrell	Metz
Philadelphia, Pa.	Johnson Motor Car Co.	Haynes	Waterloo, Ill.	James Bennett	Haynes
Plattsburg, Mo.	C. R. Young Auto Co.	Jeffery	Waterloo, Ill.	James Bennett	Buick
Piper City, Ill.	Geo. C. Leidhold	Jeffery	Wentachee, Wash.	W. T. Thornhill	Jeffery
Pittsfield, Mass.	Pittsburgh-Haynes Auto Co.	Haynes	Weston, Mo.	Weston Auto Co.	Jeffery
Pittsburgh, Pa.	J. H. Fairchils & Son	Jeffery	Westerly, R. I.	H. C. Barber	Jeffery
Pittsburg, Kan.	W. T. Embree	Cole	What Cheer, Ia.	Frank L. Emery	Jeffery
Portville, N. Y.	A. E. Anderson	Jeffery	Wollaston, Mass.	Wollaston Centre Garage	Jeffery
Princeton, Ill.			Worcester, Mass.	F. S. Howard	Jeffery

COMMERCIAL CARS

Ashland, Wis.	H. D. Ewer	Chase	Montreal, Que.	Legare Gadbois Automobile Co.	Gramm
Crisfield, Md.	H. P. Ford Machine Co.	Chase	Morristown, N. J.	C. L. Lade	Chase
Charlotte, N. C.	Chase Motor Truck Sales Co.	Chase	New Haven, Conn.	G. W. & A. J. Phillips	Chase
Cameron, Tex.	J. B. Cavitt	Chase	Orlando, Fla.	J. B. Magruder	Chase
Denison, Tex.	R. L. Aspley	Chase	Olney, Tex.	W. W. Benson	Chase
Greenville, S. C.	Bridges & Sone	Chase	Savannah, Ga.	Fred H. Haar & Son	Chase
Great Falls, Mont.	E. L. Vineyard	Chase	Springfield, Ill.	O. W. Halcher Co.	Chase
Knoxville, Tenn.	E. W. Gillispie	Chase	St. Louis, Mo.	M. W. Bond	Chase
Jackson, Miss.	W. H. Allen	Chase	Sulphur Springs, Tex.	H. H. Alvord	Chase
Jackson, Miss.	Robert Littrell	Chase	Stephenville, Tex.	C. R. Coulter	Chase
Mart, Tex.	J. M. Booth	Chase	Waxahaxie, Tex.	Bounds & Norsworthy	Chase
Meridian, Miss.	M. R. Adams	Chase			

Illinois Garagemen Combining to Eliminate Evils of Their Business

BOOMINGTON, Ill., Nov. 10—Garage proprietors of Bloomington have decided to organize a local association for their mutual welfare, and protection against the man who will not pay his repair bills. With the rapid growth of the garage business of late years, the dealers in Bloomington, as well as in all other cities of any considerable size, meet with aggravating and expensive conditions that demand reform. The slow-pay patron who keeps the garage collectors calling upon him month after month and who finally pays under threat of a suit, and who retaliates for the favor of long extended credit by transferring his patronage elsewhere, will be placed upon a list, a copy of which will be furnished each member.

It also is desired to protect the mem-

bers against various impositions which only the co-operation of all of the repair shops can bring about. One of these is the individual who drives his car into a garage, pays no storage, borrows tools, frequently failing to return them and sometimes carrying them off, and who sponges in many other ways from the shop and without paying anything for the accommodation given him.

There is another individual who arouses

the indignation of the repair man, and, while enjoying the courtesy and hospitality of the proprietor, will take advantage of a tip heard in the garage that some patron is about to buy some supplies, by filling the order for them and taking about one-half of the legitimate profit of the dealer who has rent, light and heat to pay for.

Another individual who arouses the ire of the proprietor is the curbstone repair artist who is constantly seeking the light work in the way of adjustments which can be given attention at private garages. It is this class of work which is most profitable to the garages and yet they are forced to lose much of it.

A meeting will be called soon and the organization perfected.





From the Four Winds



S EATTLE Speedway Contract Let—The Seattle Motor Speedway Association, Harry Doherty, manager, has let the contract for the 2-mile racing course and grandstands.

Sheriff Sells Motor Cars—A. K. Richardson of Harney county, Oregon, combines both the motor car business and county business by acting as Buick agent and as sheriff of Harney county.

Alaska Has Good Roads Club—Citizens of Cordova, Alaska, have organized the Alaska Good Roads Club for the purpose of co-operating with Fairbanks to secure the establishment of a motor road from Chitina to Fairbanks and to secure a summer mail service overland.

New Speedway Publicity Director—Fred Wellman, formerly motor editor of the Indianapolis News, has become director of publicity for the Indianapolis motor speedway. He succeeds Paul R. Martin, who has become business manager for the theatrical interests of Henrietta Crosman.

Ohio May Adopt Road Patrol—A committee representing the Ohio Good Roads Federation and the two houses of the Ohio general assembly is investigating the system of road patrolling in vogue in the states of Massachusetts and New York, with the purpose of installing the same system in Ohio. The committee is now visiting the two eastern states.

Anti-Noise Bill Is Killed—St. Louis' anti-noise measure, which would have prohibited the operation of motor cars with cut-outs open, was killed in the house of delegates, the lower branch of the municipal assembly, last week. The measure, which was killed unanimously, carried with it a provision barring exceedingly bright lights. The motor car dealers' association, motor club and the Business Men's League had advocated its passage.

Kansas Bills Good Roads Meeting—Governor Major of Missouri has accepted an invitation from the governor of Kansas to attend the good roads meeting to be held at Newton, Kan., December 4 and 5. During the good roads days in this state in August, Governor Hodges was a willing worker, and Governor Major is anxious to help the Kansas movement, even to the extent of wielding a shovel and pick as did the Kansas executive in Missouri.

Boom for All-Southern Highway—It is predicted by D. E. Colp, president of the San Antonio-San Francisco Highway Association, that the All-Southern transcontinental highway will be the first of the projected ocean-to-ocean roads to be completed. A. L. Westgard, vice-president and director of transcontinental highways of the National Highways Association of New York, is going over the region between Alpine and El Paso in the interests of the proposed highway and has met with gratifying success in organizing associations to carry on the work.

Motor Car Thieves Have Nemesis—In its effort to eliminate the "borrowers" of motor cars the Automobile Club of St. Louis last week secured the arrest and conviction of three men. The thieves, who stole E. C. Van Nort's car in April, were sentenced to 6 months each in the city workhouse. The club's reward of \$150 was divided between two local patrolmen and two officers from the county court who aided in the pursuit and capture of the joy-riders. This is the fifth conviction the club has secured. Since the law making a high fine and sentence possible

to tamper with or take a motor car was passed the pernicious practice of taking cars by joy-riding thieves has been lessened. The club aids the authorities in all cases and hires a special prosecutor.

License Fees Total \$1,000,000—Motor car license registrations in Pennsylvania so far this year show an increase of 30,000 cars over last year, and the income to the state from this source is expected to be approximately \$1,000,000.

Woman Wins Reliability Run—The Missouri Athletic Club's first reliability run, which lasted 4 hours—no record of distance was made—was won by Miss Ethel Dawson. Miss Dawson, who was the only woman driver, had a perfect score. The run was for members of the club only, and the scores made were based on the driver's skill in handling his or her car and general knowledge of the traffic regulations. The tour led through St. Louis and the county.

Divorce Politics from Road Work—To take the building and upkeep of good roads out of the hands of the politicians is one of the hobbies of Governor Ernest Lister of Washington. The governor believes the state should spend all the money it can for the building of good roads, but he decries the heavy bonding of the states or of any community in order to build them. He does not believe the people should be taxed without reason for any purpose.

Favor 25-Mile Speed Limit—The Massachusetts highway commission has intimated that next year it again will make an attempt to put through the 25-mile-an-hour speed limit that fell through this year. It is held that a flat rate would be a good thing to check speeding. Last session the bill got by the committee and into the legislature, where it was killed. It is believed that if the commission allowed it to be 30 miles an hour that the motor opposition would not be so strong against it. There may be a compromise.

Curbing Red Cross Speed Abuse—Designs in the pavement prescribing zones for the turning of corners is one of the features of the new traffic ordinance of El Paso, Tex. Under the new arrangement cars will not be allowed to stand at a corner in the business section more than 20 minutes. Red Cross signs have been abused by those who would exceed the speed limit, it is declared, and in the future a special flag will be used by physicians or others who must exceed the speed limit for humanitarian reasons. The physician or any other person making use of the privilege must fill out a form within 2 days, giving the particulars of the emergency to the police.

Finds Horse Is Too Gluttonous—Thomas A. Edison is authority for the statement that the horse is the poorest motor ever built, and motor car manufacturers are finding that the wizard of East Orange knows whereof he speaks. In the plant of the Willys-Overland Co. of Toledo, O., recently thorough research has shown that the average work horse will eat nearly eight times his own weight in a year. And yet the hauling power developed represents only about 2 per cent of what should be expected from his expenditure. A horse eats 10 pounds of food for every hour he works. He eats 12,000 pounds of food every year. A motor truck consumes no fuel—and this is the food of the vehicle—when it is not working. The minute the motor stops the feeding cost stops. The superiority of the motor also is shown in the power developed.

The 35-horsepower truck will carry 1,500 pounds of merchandise from 6 to 10 miles on a single gallon of gasoline. This is a vastly greater return in energy for the money expended than the 2 per cent showing the horse makes.

Canada and Japan Reciprocate—The Automobile Club of Canada has made reciprocal arrangement with the Nippon Automobile Club of Nippon, Japan, whereby the members of either club visiting the country of the other will be accorded member's privileges and courtesies.

Roads Congress for Canada—The first Canadian roads congress, a national convention arising out of the crying needs in all the provinces for better roads, will be held in Montreal either in January or February. The federal and provincial governments are co-operating with the Automobile Club of Canada, as well as the local and foreign road associations, boards of trade, municipal and county councils and societies in general, to make the congress a big educational movement.

Road Work Stopped by Rain—Heavy rains over practically the entire state caused a general postponement of Texas' good roads days, scheduled for November 5 and 6. The work was carried on as planned in some sections, but the rains were so heavy in most places that road building was impossible. The promoters of the plans in the different counties and districts are greatly disappointed, but hope to be able to carry out their plans at later dates. The governor has issued a proclamation for a postponement, but each community will select its own days.

State Association Elects Officers—The annual meeting of the Massachusetts State A. A. was held last week in Boston, Mass., and officers for the coming year were chosen. Lewis R. Speare of Boston, Mass., was elected president; John P. Coghlin of Worcester, Mass., vice-president; James Fortesque, Boston, Mass., secretary-treasurer. These men have held those offices for the past 2 years. Secretary Fortesque gave a brief resume of the work done during the past year in forming clubs and preventing hostile motor legislation.

War Cars for Huerta's Army—Delivery of the first two armored Protus motor vehicles has been made to the Mexican government. The war cars have been tested and found to be entirely satisfactory. Each is equipped with two machine guns. Twenty such cars are to be furnished by the Berlin factory. Each motor will develop 70 horsepower. The cars are designed principally for the defense of the capital. The splendid roads of the federal district especially lend themselves to the effective operation of these cars against an enemy likely to use guerilla tactics. A few of the new cars, however, will be tried out in some of the interior campaigns.

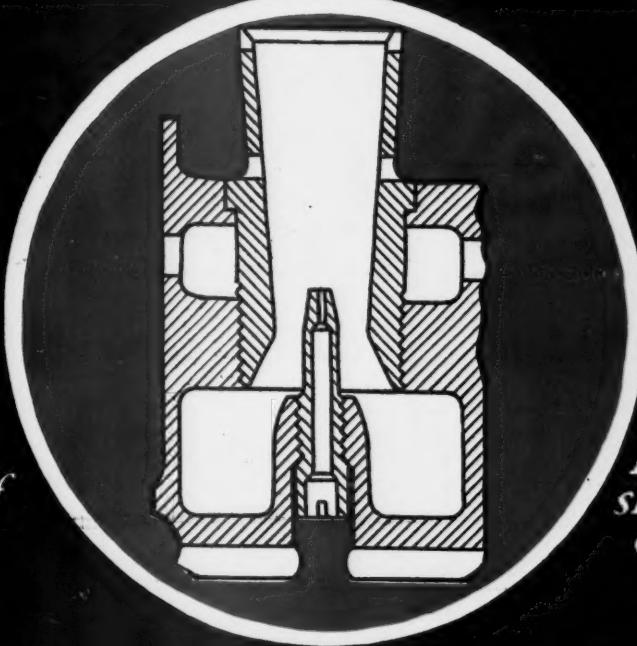
Motorists to Maintain Roads—The Midland Automobile Association has been formed at Midland, Tex., and fifty motorists have signed a year's contract for the maintenance of the roads in that section. Owing to the peculiar situation in that region, where most of the motor car traffic is over special roads through large pastures which are private roads in reality, although used by the public in general, the maintenance of the roads falls upon private persons. The new association will make possible a uniform distribution of the maintenance and improvement work among motor car owners. H. F. Burns has been made manager of the association.

It increases power

It swirls the mixture

It makes every drop of fuel count

It delivers a smooth mixture at all speeds



Stromberg CORRECT Venturi

Another concrete reason why STROMBERG Carburetors are considered the standard by which all other carburetors are measured, is found in the construction of the STROMBERG Venturi.

STROMBERG
CARBURETORS
"The Accepted Standard"

If a Stromberg Carburetor was built to mix air and water, or air and alcohol, or in fact anything besides air and the *present day* gasoline, the construction of its venturi tube would undoubtedly be different.

But, built to mix air and the *present* gasoline, the Stromberg Venturi is *correct*—not by chance—but as the result of extensive experimenting in our laboratories and on the road.

There is no manufacturer of carburetors today who has developed the venutri tube to so high a degree of perfection as in the Stromberg—likewise there is no carburetor today which delivers the same uniformly smooth mixture at every speed—with the same economy.

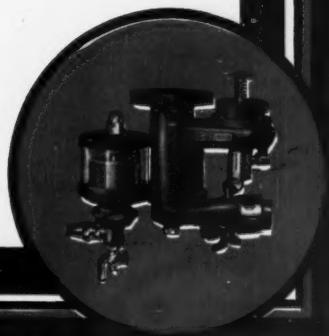
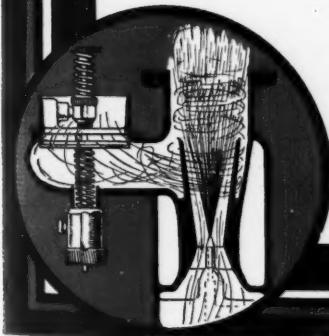
Because of this uniform mixture the greatest power is obtained—also because of its smoothness a quick snappy pick-up is the response to the throttle opening.

Stromberg Motor Devices Company
54 E. 25th St., Chicago, Ill.

Branches: NEW YORK, BOSTON, DETROIT,
INDIANAPOLIS, MINNEAPOLIS

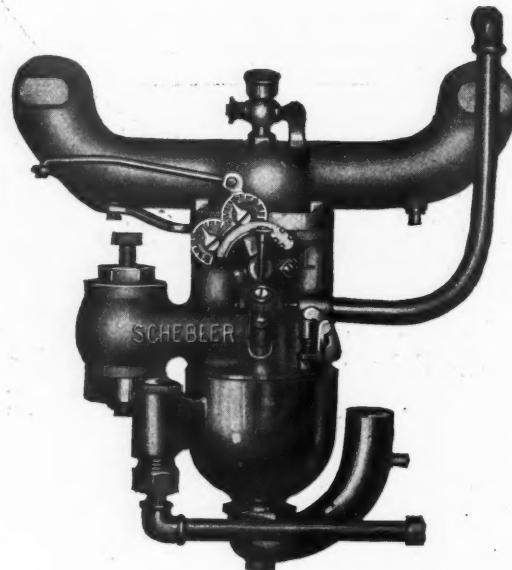
Pacific Coast Distributors: Chanslor & Lyon Company, Los Angeles,
Portland, Fresno, Spokane, San Francisco, Seattle.

Canadian Distributors: Russell Motor Car Company, Toronto,
Montreal, Hamilton, Winnipeg, Calgary, Vancouver.



The Schebler Carburetor

With Manifold and Attachments for
FORD CARS



**Will Give—
More Power, Speed
Flexibility**

**Easier Starting
Lower Throttling
Quicker Pickup**

Write Home Office or Branches for particulars and prices

WHEELER & SCHEBLER, Indianapolis, Ind.

BRANCHES:

FRY & MCGILL MOTOR SUPPLY CO.	Denver, Colo.	WHEELER & SCHEBLER	Chicago
AUTOMOBILE ACCESSORIES CO.	Pittsburgh, Pa.	WHEELER & SCHEBLER	Detroit
FERRIS-DUNLAP AUTO SUPPLY CO.	Dallas, Tex.	FRED CAMPBELL	St. Louis, Mo.
INTERSTATE ELECTRIC CO.	New Orleans, La.	W. J. CONNELL	Boston, Mass.
REINHARD BROS. CO.	Minneapolis, Minn.	EQUIPMENT CO.	Kansas City, Mo.
MANUFACTURERS' SUPPLY CO.	Philadelphia, Pa.	ELYEA-AUSTELL CO.	Atlanta, Ga.
WEINSTOCK-NICHOLS CO.	Los Angeles, Cal.	J. C. NICHOLS	New York City
PENNSYLVANIA RUBBER & SUPPLY CO.	Cleveland	WEINSTOCK-NICHOLS	San Francisco

FAIRBANKS, MORSE & CO., Ltd., London, England
CANADIAN FAIRBANKS-MORSE CO. (All principal Canadian Cities)

THE KLAXON IS NOT AN "ELECTRIC HORN"

HERE'S a big difference.

Explain it to your customers before they buy a signal, rather than let them find it out afterwards.

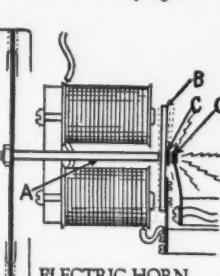
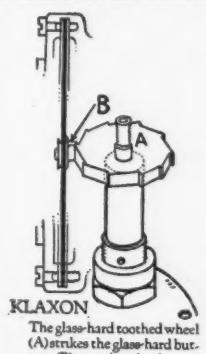
The principle of operation is different

The Klaxon is a noise-machine.

Its diaphragm is vibrated by a toothed wheel.

This wheel is rotated by an electric motor;—or, in the case of the Hand Klaxon, by a train of gears that attain high speed under pressure on the push-rod.

Each double vibration means that one tooth of the glass-hard steel wheel slips past the glass-hard steel button on the diaphragm.



The glass-hard toothed wheel (A) strikes the glass-hard button (B) on the diaphragm.

The vibrating-armature (B) strikes the adjustable rod (A) which is attached to diaphragm, and breaks contact at points (C). Unless these points are made of platinum iridium, they soon wear down and the mechanism becomes inoperative.

The diaphragm of an "electric horn" is vibrated by a "buzzer"—the same as that used for door-bells, pantries and offices.

Each double vibration means a spark between two points.

Unless these points are made of platinum iridium—the cost of which is prohibitive—they quickly wear off and the buzzer is useless.

The note is different

THE KLAXON NOTE is loud. It is sharp and clean-cut—totally unlike the nasal "buzz" of an electric horn. One Klaxon "tiger" (a short, abrupt note made by lightly touching the Klaxon push-button) is more effective than a dozen "buzzes." Yet it makes less actual noise. Klaxon noise is "concentrated"—not drawn out.

LOVELL-McCONNELL MFG. COMPANY, MAKERS OF THE "KLAXON," NEWARK, N.J.

More Service

7 More Direct Factory Branches

50 More Service Stations

WE are now operating 8 direct factory branches in New York, Boston, Buffalo, Cleveland, Detroit, Indianapolis, Chicago and San Francisco.

In addition to this we are opening up 7 more direct factory branches in

Philadelphia Atlanta
Pittsburg

Los Angeles

Minneapolis St. Louis
Kansas City

This will make 15 direct factory branches.

We have in operation right now 53 service stations at the following points:

Albany, N. Y., 288 Central Ave.
Birmingham, Ala., 519-21 S. 20th St.
Bloomsbury, London, W. C.
Bridgeport, Conn., 433 Canon St.
Brooklyn, N. Y., 1186 Bedford Ave.
Christ Church, New Zealand
Dallas, Texas, 1922 Main St.
Davenport, Iowa, 217 Iowa St.
Dayton, Ohio, 102 N. Main St.
Denver, Colo., 1616 Broadway
Des Moines, Iowa
Edmonton, Alb., Can.
Erie, Pa., 1721 Sassafras St.
Fort Wayne, Ind., 115 Washington St.
Halifax, Nova Scotia, Can.
Hamburg, Germany
Hartford, Conn., 14-15 Wells St.
Houston, Texas, 1311 Main St.

Jacksonville, Fla., Laura and Church
Little Rock, Ark., 919 Main St.
Louisville, Ky., 928 Motor Row
Memphis, Tenn., 276 Monroe Ave.
Milwaukee, Wis., 126 Grand Ave.
Montreal, Que., Can., 97 Belury St.
Newark, N. J., 237 Halsey St.
New Orleans, La., 613 Baronne St.
Norfolk, Va., 2005 Brambleton Ave.
Omaha, Neb., 2119 Farnum Ave.
Oshawa, Ont., Canada
Paris, France, 107 Avenue Parmentier
Portland, Me., Free St.
Providence, R. I., 12 Fountain St.
Puteaux, Seine, France
Regina, Sask., Can.
Richmond, Va., 106 N. 8th St.
Rochester, N. Y., 205 State St.

San Antonio, Texas
Salt Lake City, Utah, 36 W. 2d, South
San Diego, Cal., 1125 Date St.
San Francisco, Cal., 1447 Van Ness Ave.
Sydney, N. S. W., Australia, 284 Pitt St.
Spokane, Wash.
Springfield, Mass., 317 Dwight St.
Syracuse, N. Y., 217 Grave St.
Transvaal, Africa, 96 Marshall St.
Trenton, N. J., 315 S. Broad St.
Toledo, Ohio, 2235 Madison Ave.
Toronto, Ont., Can., 469 Yonge St.
Washington, D. C., 1328-1330 New York Ave., N. W.
Worchester, Mass., 16 Mechanics St.

In addition to this we are opening up 50 more service stations so that there will be a Stewart-Warner branch or service station in practically every important city of America.

We give more speedometer service than all the other speedometer manufacturers of the world put together.

All Warner Auto Meters are backed with a one year guarantee, liberally interpreted.

Stewart-Warner Speedometer Corporation

1931 Diversey Boulevard, Chicago, U. S. A.

WARNER
AUTO-METER

Stewart
Speedometer
MAGNETIC PRINCIPLE

Manufacturers of Electric Lighting and Starting Equipment Who Use and Recommend



Storage Batteries

Adams-Bagnall Electric Co.	Cleveland, O.	Hartford Suspension Co.	Jersey City, N. J.
Adams & Westlake Co.	Chicago, Ill.	Holtzer-Cabot Electric Co.	Brookline, Mass.
Bailey Electric Co.	Grand Rapids, Mich.	Ide Engine Co.	Springfield, Ill.
Bijur Motor Lighting Co.	Hoboken, N. J.	Ignition Starter Co.	Detroit, Mich.
Briggs Magneto Co.	Elkhart, Ind.	Jones Electric Starter Co.	Chicago, Ill.
Dayton-Dick Co.	Quincy, Ill.	Kemco Elec. Mfg. Co.	Cleveland, O.
Dean Electric Co.	Elyria, Ohio	Leece-Neville Co.	Cleveland, O.
Detroit Electric Appliance Co.	Detroit, Mich.	National Coil Co.	Lansing, Mich.
Diehl Mfg. Co.	Elizabethtown, N. J.	North-East Electric Co.	Rochester, N. Y.
Dyneto Electric Co.	Syracuse, N. Y.	Northwestern Mfg. Co.	Milwaukee, Wis.
Economy Mfg. Co.	York, Pa.	Remy Electric Co.	Anderson, Ind.
Electric Auto-Lite Co.	Toledo, Ohio	Rushmore Dynamo Works.	Plainfield, N. J.
Electro Light & Starter Co.	Indianapolis, Ind.	Splitdorf Electric Co.	Newark, N. J.
Emerson Electric Co.	St. Louis, Mo.	Wagner Electric Mfg. Co.	St. Louis, Mo.
Esterline Co.	Indianapolis, Ind.	Ward Leonard Electric Co.	Bronxville, N. Y.
Fisher Electrical Works.	Detroit, Mich.	R. C. Wells Mfg. Co.	Fond du Lac, Wis.
Gray & Davis.	Boston, Mass.	Westinghouse Elec. & Mfg. Co.	East Pittsburgh, Pa.

COUNT THEM

And if you are at all familiar with the various Electric Lighting and Starting Systems you will readily note that there are but **three manufacturers** whose names do not appear in this list.

A Total of 37 Manufacturers of whom 34 Recommend the Use of **ELBA** Batteries or 91.9 Per Cent

and Agents for cars not equipped with **ELBA** Batteries are insisting that their manufacturers shall adopt them instead of those which are imitations of the **ELBA**.

This overwhelming preference for **ELBA** Storage Batteries is not due to price considerations, as they are not sold on price.

The actual performance, superior quality, long life, enormous manufacturing facilities, and our unequalled service organization are the features that prompt the far-seeing manufacturers to pin their faith to the **ELBA**.

When you buy a car, remember that the starting and lighting system is a vital part of the car equipment.

You want the best. If you insist on a system made by any firm in the above list, you get an **ELBA** Battery with it—if you accept one of the other three, remember that you are not getting a system whose elements are of the best—and only from a combination of the best can be secured that perfect, harmonious operation which insures the utmost efficiency and satisfaction.

Write us for full information

Willard Storage Battery Co. CLEVELAND, OHIO

New York Branch: 136 W. 52d St.
Detroit Branch: 1191 Woodward Ave.

Chicago Branch: 2241 Michigan Ave.
San Francisco Branch: 243 Monadnock Bldg.

(76)

Depots in all principal cities in the United States and Canada.

Just Insert "Fingers" of Top Lifter in Bow Holes—and Back She Slides, as Slick as Grease—

This is the synopsis of the simple directions which accompany this wonderful sixty second device, now coming into universal use.

The Simplex Auto Top Lifter makes the work of raising or lowering the top a pleasure instead of a task. With it as part of your car equipment, you are forever relieved from the annoying, irritating, sometimes prolonged work of getting the cover up and down.

The device itself can be adjusted inside of ten seconds, and it then takes the place of one man because it operates in unison with your movements on the other side of the car.



is a highly polished, telescopic arrangement which can be readily closed up and thrown into the tool box. It is telescopic in order that it may accommodate itself to cars of different body lengths.

It comes in three sizes, and when ordering it will be necessary for you to give the name, model and year of your car.

In the whole big world of automobile accessories, this is perhaps the most necessary. The price, \$2.50, ought to be small enough to induce every car owner who reads this advertisement to at once free himself from the troubles incident to raising and lowering the top.

The Biggest \$2.50 Buy You Ever Made

And worth many times the purchase price. No detailed description is necessary. The Simplex Auto Top Lifter is so simple as to require little description. You just get it and you will catch the idea in less than a minute. Then you will advertise it to your friends—and they will fall in line.

Send in your order today—that is, if your dealer has not yet stocked up, or have him order it for you if you will. By all means get it—and get it today.

DEALERS

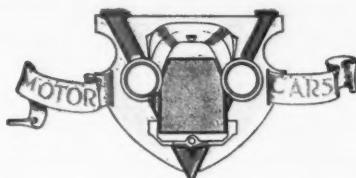
Read this advertisement carefully. It holds an opportunity for you to clean up a sale from practically every touring car owner in your vicinity. The price makes it attractive. Your commission is liberal. Act quickly and before your territory is covered by some other progressive dealer, and begin by ordering a demonstrating device. The top lifter will then sell itself.

Simplex Specialties Company, 69 Buhl Block, Detroit, Mich.

Vaughan Car Co., Inc.

Kingston, N.Y.

A. B. CORDNER, PRES'T.
ORLANDO F. WEBER, V. P.
H. W. JOHNS, TREAS.
E. S. PARTRIDGE, SEC.
CHESTER GRISWOLD, C. E.



November Twelve
1 9 1 3

FIRST ADVERTISEMENT

We have to offer a motor car selling franchise of extraordinary value to 50 efficient, successful automobile dealers in as many cities.

These fifty men should be representative of the front rank of American automobile distributors, able business men; successful and aggressive, first quality men for a first quality connection.

The possibilities are wonderfully interesting.

Have you ever asked yourself this question: "When will the real automobile that I have been waiting for come along?"

The car that will stand out from the mass so sharply, so distinctively, that even a man who knows motor cars will quickly say at first sight

"HERE'S A REAL AUTOMOBILE"

Gentlemen, we have A REAL AUTOMOBILE.

If it passed you on the street today you would turn, watch it disappear and ask

"What car is that?"

If it stopped in front of your door, stripped of every identifying mark, you might properly say

"Here's a new foreign car--Isn't it a stunner?"

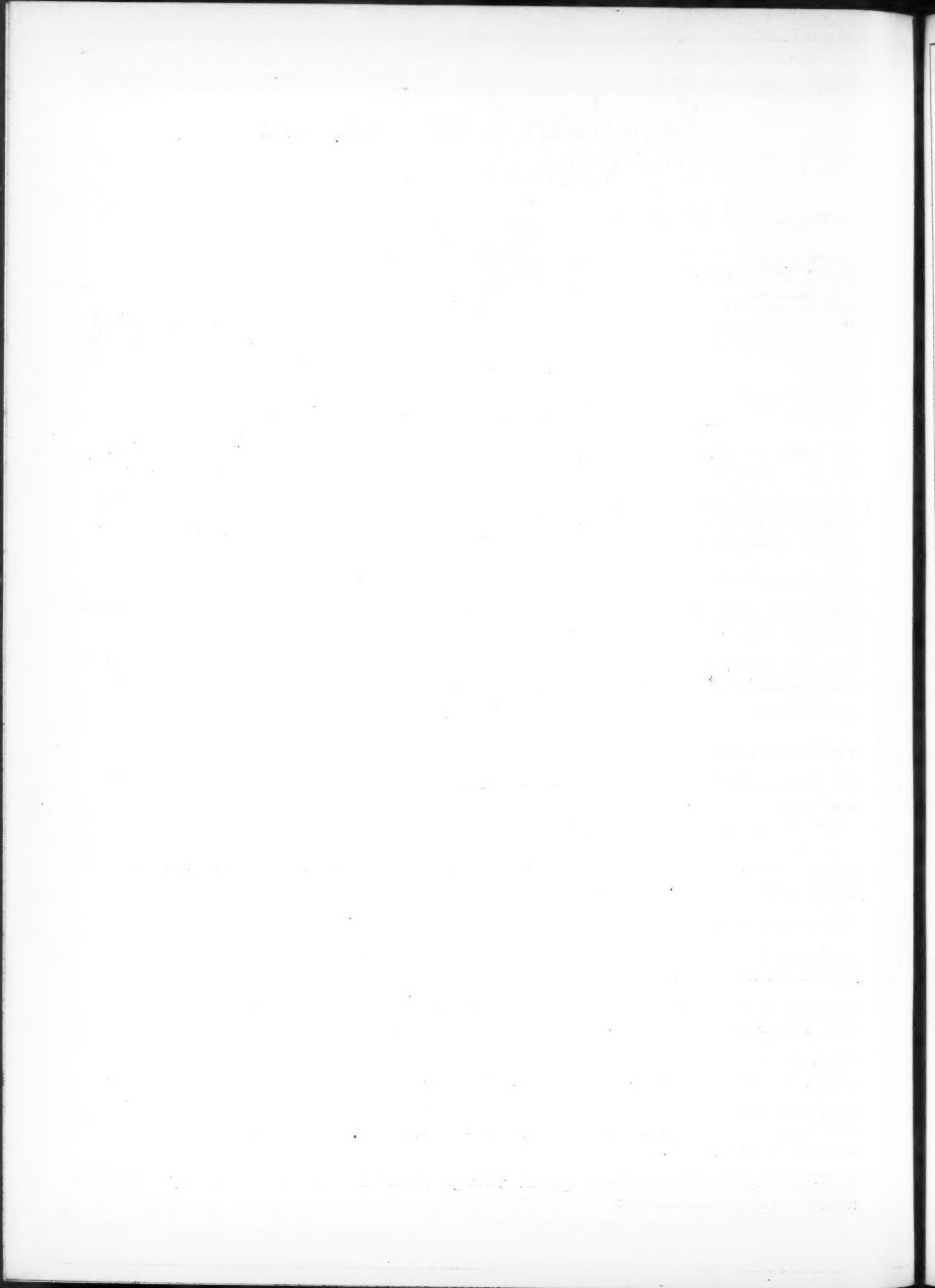
We have built a motor car in America that is not like any other car built in America.

We have put into it something which we do not believe has been put into any other American car.

That means something because there are scores of splendid American cars, wonderful cars, from every standpoint of mechanical excellence.

We have made a six-cylinder automobile that we believe is as near 100 per cent efficient mechanically as any type of motor driven vehicle thus far produced.

This motor car does three great things which in our mind typify mechanical efficiency:



IT RIDES SMOOTHLY
IT STANDS UP
IT FUNCTIONS ECONOMICALLY

That is the alpha and omega of motor car construction.

We could write pages about our motor, transmission, axles, electric starter and the other essentials of construction,--THEY ARE ALL THERE; nothing is missing.

It is a joy to sit at the wheel of this car. The more you know of silent, easy, powerful motor car action, the more pleased you would be with the easy starting, and stopping, and perfect running of this car.

More speed than the sane motorist needs except in emergencies,--power to take any hill or grade that a car may be asked to climb.

THE NEXT GREAT STEP FORWARD
IN AUTOMOBILE CONSTRUCTION AND
DEVELOPMENT IS NOW ANNOUNCED:

THE APPEAL TO THE EYE

Having an efficient car of the highest class "under the bonnet," we have made a great stride forward in the appeal to the eye.

We now ask you to concentrate on this important, vitally important, feature. We have made a car that has that distinctive quality which instantly evokes admiration and favor--STYLE--

This new car is the smartest, best looking, "best dressed" car, if we may say it, that is to be bought in America--and the price is \$2750. We have produced a car with individuality,--a car that a man or woman of good taste will instinctively approve and prefer,--a car that may be put in a show window with the definite assurance that it has that "appeal to the eye" which is so powerful in its possibilities to attract the purchaser who wants style.

We are prepared to show the car to the fifty men, we will take them over smooth roads and rough--they can sit at the wheel and put the car through its paces in their own way, and then we will talk business.

The planning, development and construction of this car was all done silently,--like the car itself. There has been no publicity. Now we are ready.

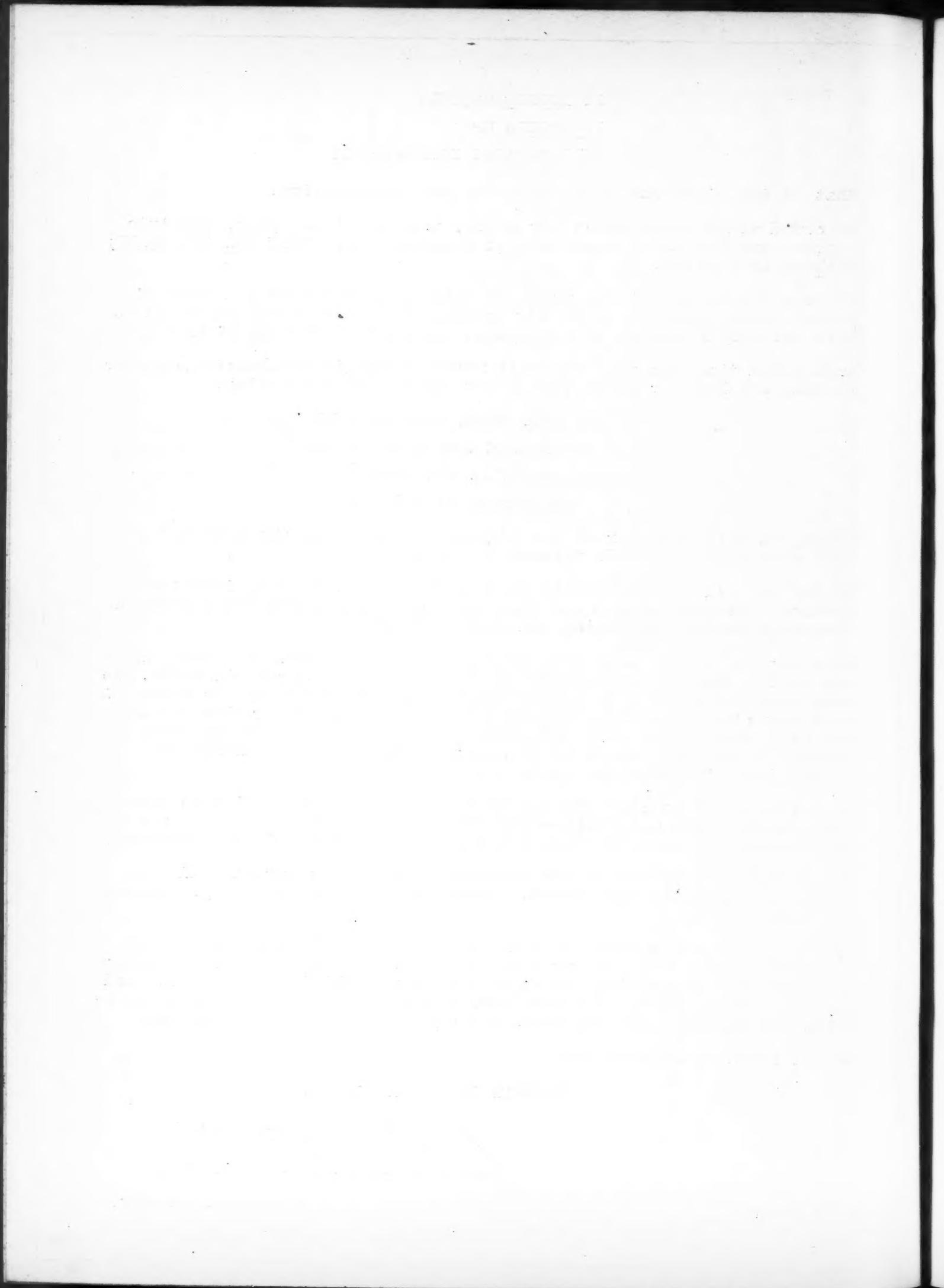
If you are in the Automobile business "for keeps," in the right way and in the right city, let us hear from you. We can show you something so decidedly interesting, so replete with possibilities of profit and prestige, that you will be glad that this advertisement attracted your attention and that you followed it up with a letter, wire, or call.

Get in touch with us---TODAY.

VAUGHAN CAR COMPANY, Inc.



General Manager.



NEW DEPARTURE

QUALITY GUARANTEED



AMERICAN MADE FOR AMERICAN TRADE
BALL BEARINGS
The NEW DEPARTURE MFG. CO.
BRISTOL, CONN.

When Writing to Advertisers, Please Mention Motor Age.

American Axles

Supply the Most Efficient Type of the Silent Worm Drive: The Lanchester-Daimler



The above statement is not offered as an argument; it is simply the consensus of leading automobile engineers on both sides of the Atlantic.

While America discussed the worm drive, England tested it. While Americans theorized as to whether its acknowledged advantages could be extended to electric and gasoline pleasure cars, foreign motorists were already enjoying its wonderful efficiency.

For more than two years we have regularly mounted the Lanchester-Daimler—the accepted leader among worm drives—in a full floating *American* Axle fitted throughout with the finest of foreign ball bearings.

We count ourselves fortunate in holding the sole American rights as axle manufacturers to the use of this drive.

Automobile manufacturers who have adopted our axles are equally fortunate; they offer in this worm drive a known quality, together with a mounting that represents the highest ideals of American manufacturing.

*The adjusting and full-floating features of
American Axles are fully covered by our own
patents and by shop rights from other patentees*

The American Ball-Bearing Company, Cleveland, Ohio

*Established 1880
Incorporated 1899*

Oldsmobile 1914

Equipment 1914 Oldsmobile Model 54

Combination electric and oil side and tall lamps, special Oldsmobile design. Special design Oldsmobile electric head lamps. Special design three-way adjustable ventilating windshield. Top, boot, and patent adjustable side curtains. 60 Miles speedometer. Adjustable stem setting and winding Waltham clock. Rear tire irons, capacity for two tires. Demountable rims, one extra. Imported horse-hair tonneau mat. Motor-driven air pump. Famous Delco starting, lighting and ignition system. Electric light in tonneau. Extension electric trouble lamp. Tools, jack. Patented bow separating top holders. Adjustable auxiliary seats in seven-passenger. (Extra, at additional cost, wire wheels; special Oldsmobile touring trunks.) Motor, 50 horsepower, six cylinders, unit power plant, three-point suspension. Bore 4 1/4, stroke 5 1/4. Extreme length of four and five-passenger models, 16 feet. Extreme length of seven-passenger, 17 feet. Spring front, semi-elliptic. Spring rear, 3/4 elliptic, underslung. Tires 36x5 both front and rear. Gabriel snubbers, Kaxton horn.

The dealer who sells the Oldsmobile is dealing in known values, and enjoys the prestige of leadership, together with the liberal profits that are always accorded a leader.

There is no question of Oldsmobile superiority. Everywhere it is recognized, and the dealer who sells it need never argue the point.

Wherever automobile men meet, the new Oldsmobile Model 54 commands their admiring comment, and it is frequently noted as remarkable that such a perfect car can be built and sold for such a price.

COMBINATION FOUR OR FIVE-PASSENGER
PHAETON, TOURING, TOURING BODY TYPE

\$2975

Seven-Passenger Touring Body, \$175 Extra

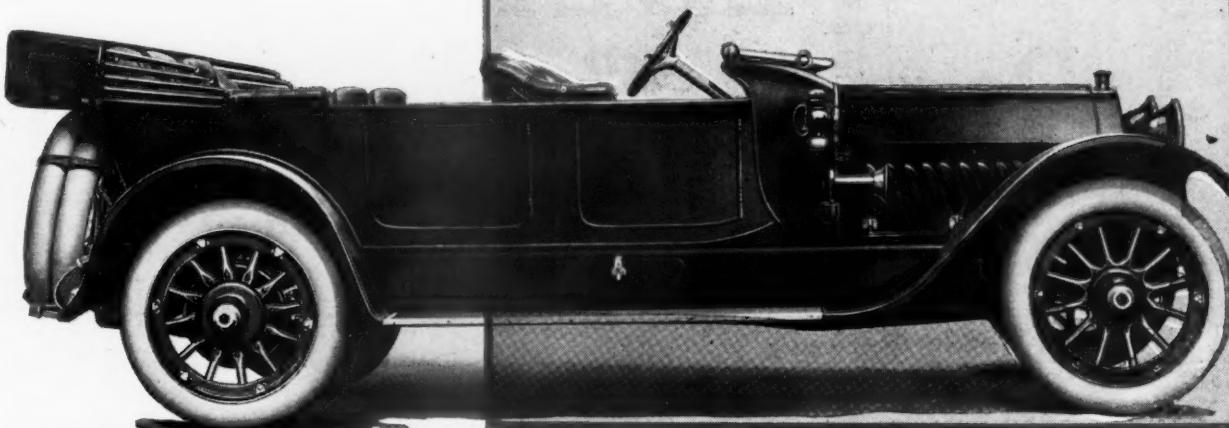
LIMOUSINE

\$4300

Our increased production for the season of 1914 permits us to allot territory to a few extra dealers.

Never in the history of this company have we been so well equipped to meet the demands of our dealers by prompt shipment of cars as ordered. We urge you to write us at once, if you are prepared to sell in your territory a car of the high stands of quality, material and design found in the Oldsmobile.

OLDS MOTOR WORKS
Lansing, Michigan



When Writing to Advertisers, Please Mention Motor Age.

A New Tire Construction



FEDERAL *Double-Cable-Base*

In this type of construction—

Side Wall Breaks Cannot Occur
Rim Cutting is Entirely Absent

Tire Cannot Blow Off Rim
Tube Pinching is Eliminated

FEDERAL Double-Cable-Base TIRES



Trade Mark



Trade Mark

One of the greatest improvements in the history of the pneumatic tire industry. A new principle of construction that positively eliminates all of the most serious forms of tire trouble.

SIDE-WALL BREAKING (often called "rim cutting") is fully overcome by the "*Flexible Bead-Filler*" built into these tires, which prevents the cutting action on the fabric, found in tires in which a high, stiff "*hard bead-filler*" is used.

BLOWING OF TIRE FROM RIM positively cannot occur with the "*Double-Cable-Base*" construction shown on the opposite page. The four Double-Cables form a strong, unbreakable anchorage of the tire to the rim, making it impossible for the bead to stretch or the tire to blow off rim while in service.

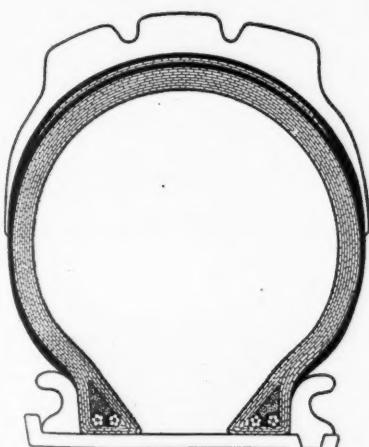
PINCHING OF INNER TUBE is entirely overcome by the strong and perfect "*heel and toe anchorage*" of the tire base to the rim. This prevents tipping or shifting of the tire base, or of the tube being pinched under the toe of the bead.

These improvements are of the utmost importance to tire users. They mean **GREATER SAFETY, BETTER SERVICE and LESS EXPENSE** for tire maintenance. And these improvements are to be had exclusively in

Federal "*Double-Cable-Base*"
Tires, Straight-Wall and
Quick-Detachable Clincher
Types at no additional cost.

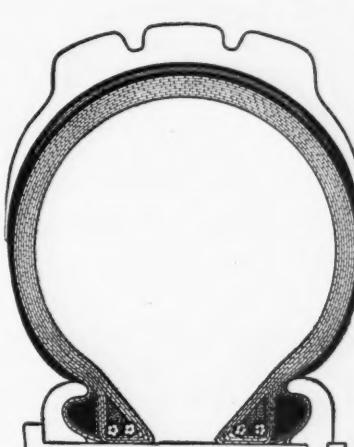
Fifty thousand of these tires have been in service during the past six or seven months, without a single complaint.

*If you are not handling Federal
"Double-Cable-Base" Tires,
write for dealers' proposition.*



Cross Section of Federal
Double-Cable-Base Tire
—Straight-Wall Type

Showing the Double-Cable-Base Construction, Flexible Bead-Filler, and method of securing perfect anchorage at "heel and toe" of the tire beads. The only construction that prevents side-wall breaks, rim cuts, tire blowing off rim, and pinching of inner tube.



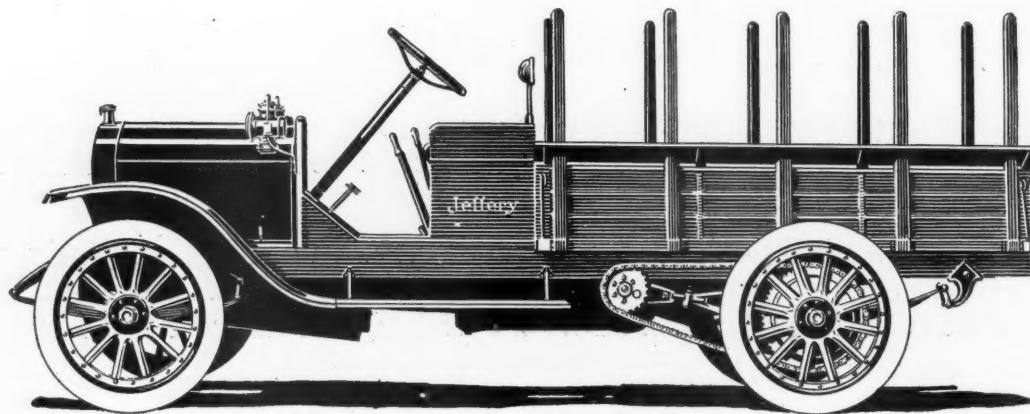
Cross Section of Federal
Double-Cable-Base Tire
—Quick Detachable Clincher Type

Embodying precisely the same construction as the Federal Straight Wall, but having an extra Bead-Filler to conform to the inside curve of the side-ring.

Federal Rubber Mfg. Co.
Milwaukee

Branches, Service Stations and Distributors
at all principal points.

Here is the *first* High Selling for \$1500—



One-Ton Jeffery Truck with body as shown, \$1575

Before offering the Jeffery One-Ton Truck for \$1500 we subjected it to stiff road tests for *more than two years* to make certain that our *buyers* would not have to pay for experimentation.

Then without public announcement we sold Jeffery trucks to over 100 merchants from coast to coast. We watched them closely to ascertain what service they would perform. They made good.

A Jeffery one-ton truck will save from 15% to 40% to merchants using horse delivery. Even if you hire your teams from horse haulage contractors a Jeffery truck will make money for you.

SPECIFICATIONS

MOTOR, 4-cylinder, 32.4 H. P., S. A. E., water cooled, dual ignition, lubrication force feed and splash system, three bearing crank shaft, three point suspension. CLUTCH, leather faced cone. TRANSMISSION, selective three speeds forward and reverse, chrome nickel heat treated gears $1\frac{1}{16}$ inch face. BRAKES, self-intensifying equalized lined foot brakes on outside of rear

wheel hub drum, emergency brake inside. AUTOMATIC GOVERNOR, driven from front wheel, limits speed to the maximum of 15 miles per hour. WHEEL BASE, 120 inches. TIRES, front, $34 \times 3\frac{1}{2}$ solid, rear 34×4 solid S. A. E. demountable. CHASSIS, includes driver's seat, supporting base, gasoline tank, fenders, hood, complete lamp equipment, complete tool equipment. CHASSIS WEIGHT, 3500 pounds.

Ask Any Banker About the Stability of this Company

Grade One-Ton Truck Jeffery Builds It

*Forty Years of Manufacturing
Experience and Five Million
Dollars in assets.*



Three-Quarter Ton Jeffery light delivery wagon with body as shown, \$1325

The Jeffery Three-Quarter Ton Light Delivery Wagon selling for \$1250 is designed for the speedy and frequent delivery of light merchandise *at low initial investment and minimum operating expense.*

This is a quality product from the shops of a high class concern. Among its users are counted many grocers, butchers, bakers, dry goods merchants, hardware dealers, gas fitters, plumbers, painters, contractors, florists, baggage express, parcels post delivery, tea and coffee merchants.

The maximum speed, regulated by an automatic governor, is twenty-five miles per hour on high, thirteen miles per hour on second, and five and one-half miles per hour on first. **DEALERS**

SPECIFICATIONS

MOTOR, 4-cylinder, 32.4 H. P., S. A. E., water cooled, dual ignition, lubrication force feed and splash system, three bearing crank shaft, three point suspension. CLUTCH, leather faced cone. TRANSMISSION, selective three speeds forward and reverse, chrome nickel heat treated gears $1\frac{1}{2}$ inch face. DRIVE, shaft and bevel gear. BRAKES, equalized lined foot brakes on outside of rear wheel hub drum, emer-

gency brake on inside. AUTOMATIC GOVERNOR, driven from front wheel, limits speed to the maximum of 25 miles per hour. WHEEL BASE, 120 inches. TIRES 34x4 $\frac{1}{2}$ pneumatic. CHASSIS, includes driver's seat, supporting base, gasoline tank, fenders, hood, complete lamp equipment, Prestolite tank, complete tool equipment. CHASSIS WEIGHT, 2900 pounds.

The Best Truck
Proposition to
Date.

Write for our
booklet ex-
plaining.

I am interested in 1-Ton Truck
Send me booklet in 1/2-Ton Truck
Name
City
State

The Thomas B. Jeffery Company

Main Office and Works, Kenosha, Wisconsin

INVADER OILS

INVADER OIL is the best—not because we say so, or because it is our product, or because we are anxious to sell it, *but, because the oil itself possesses certain definite concrete chemical tests which prove it to be better than any other.*

With the same range of fire tests, and the same range of viscosities that other oils have, Invader Oil is lighter in color and lighter in gravity.

This simply means that Invader Oil is freer from carbon than other oils



FACTORIES

NEW YORK.....92 Pearl St.
PHILADELPHIA.....113 Arch St.

BRANCHES

BOSTON.....284 Columbus Ave.
WASHINGTON.....512 Kenois Bldg.
PHILADELPHIA.....113 Arch St.

INVADER OIL

Lessees of Chas.

Main Office, 79 Broad St., New York

INVADER OILS

of equal body and consistency, and is therefore better for automobile lubrication.

The sales of Invader Oil have increased 212% during the past eight months over the corresponding period of last year. This is an indication that these facts are being appreciated in an unusually substantial manner.

Territorial agents are in a position to fill orders as promptly and at the same prices as the main office, or any branch of the Invader Oil Co.



COMPANY, Inc.
F. Kellom & Co.
N. Y. City Branch, 1906 Broadway

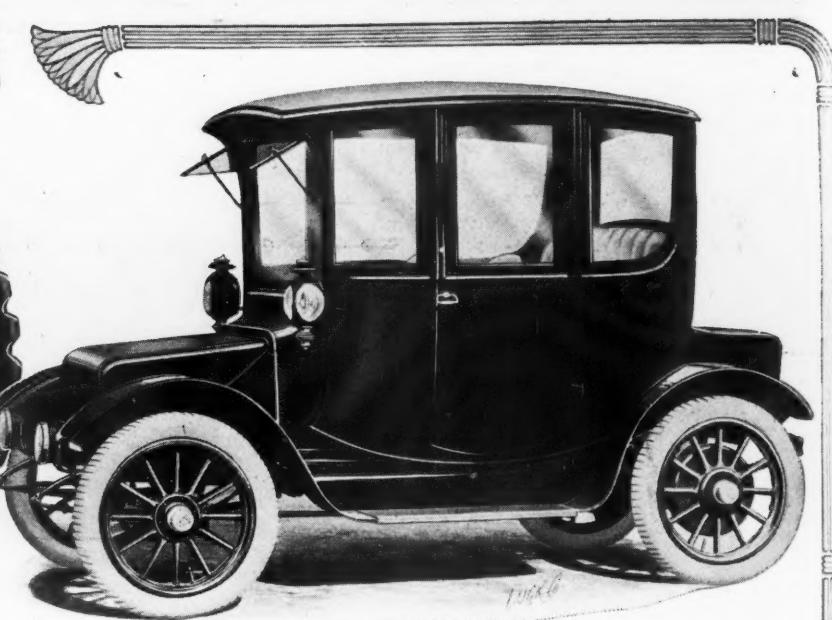
TERRITORIAL AGENTS:

Los Angeles, Cal.	W. D. Newerf Rubber Co.
San Francisco, Cal.	W. D. Newerf Rubber Co.
Tacoma, Wash.	Union Motor Car Co.
Omaha, Neb.	Lininger Implement Co.
Detroit, Mich.	Boyer-Campbell Co.
St. Louis, Mo.	Beck & Corbitt Iron Co.
Chicago, Ill.	Motor Car Supply Co.
Salina, Kansas	Lee Hardware Co.
Kansas City, Mo.	American Lubricating & Supply Co.
Portland, Me.	James Bailey Company



Three Types of Control

Front—Rear—Selective Dual
The last has a combination of either front or rear control. Select the position from which you desire to drive, according to the number of passengers. Controls and brakes are automatically interlocked by merely turning front seat to natural position required by driving conditions. The Rauch & Lang Control System guarantees positive control of your car always, under every driving condition.



Society Adopts The New Rauch & Lang Worm Drive

Again has the Rauch & Lang Electric asserted its premiership as Society's chosen car.

The success of the new worm drive has been immediate. This feature means the continued leadership in driving quality—just as the beautiful body lines, rich finish and ultra refinement of every detail have always marked supremacy of Rauch & Lang construction.

Hundreds have already ordered the new car. They are enthusiastic because the Rauch & Lang Straight Type Worm Drive (top mounted) which

is superior to all others means a greater-than-ever all-round efficiency, a silence that is manifest, a power-economy hitherto unknown, and a driving simplicity that appeals to the most timid woman.

The Rauch & Lang is the highest-priced Electric on the market. Its value is readily apparent to those who seek a car of artistic and mechanical perfection.

Any Rauch & Lang agent will gladly demonstrate. Catalog mailed on request.

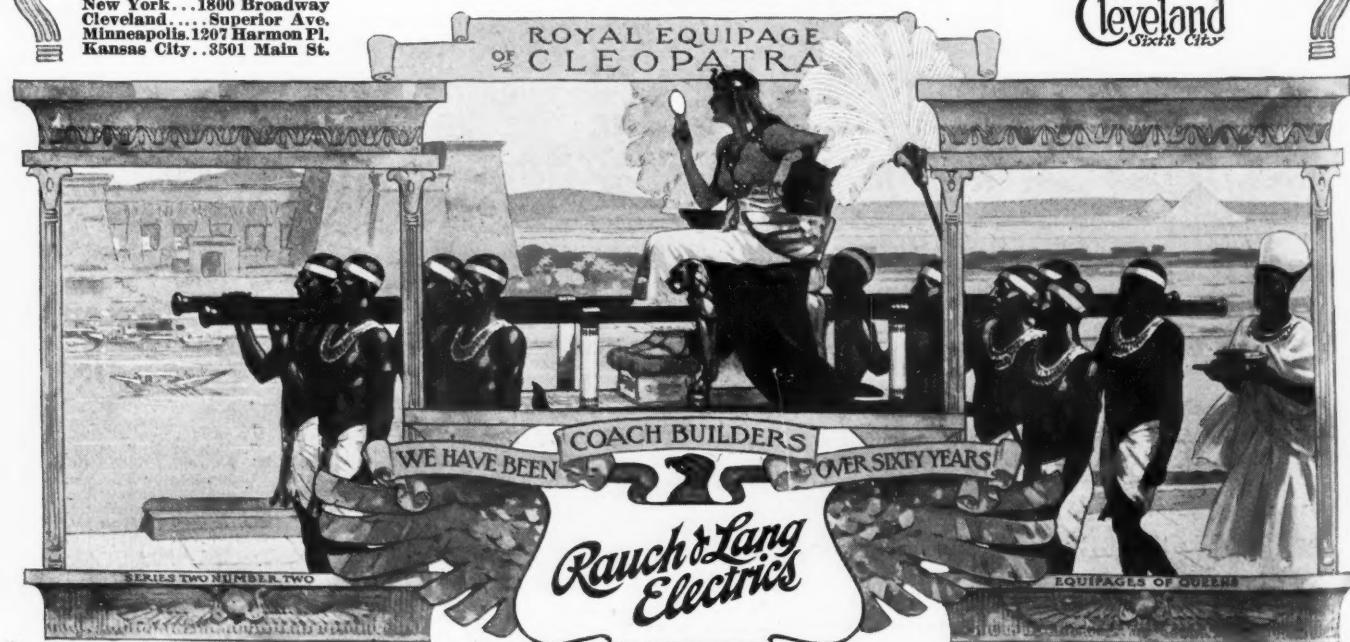
MAKERS OF COACH HISTORY—For over sixty years Rauch & Lang have been building fine vehicles for a select patronage. In each successive vehicle era they have been accorded the leadership. Strict adherence to lofty art ideals and a wonderful mechanical perfection have won and held the acclaim of people of refinement. (147)

THE RAUCH & LANG CARRIAGE COMPANY

2205 West Twenty-fifth Street

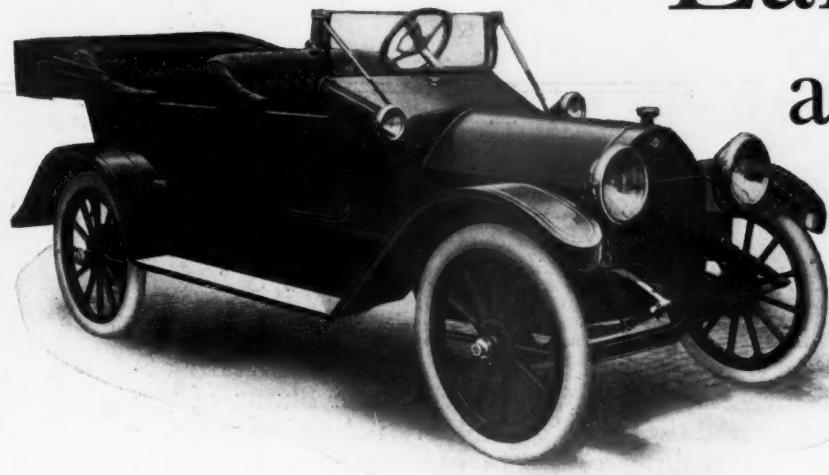
BRANCHES AT
New York... 1800 Broadway
Cleveland... Superior Ave.
Minneapolis 1207 Harmon Pl.
Kansas City... 3501 Main St.

Cleveland
Sixth City



When Writing to Advertisers, Please Mention Motor Age.

This Lambert Car at \$1200



Is a Real Business Getter

Electric lights and starter
Continental or Rutenber Motor
112" Wheelbase
Lambert Gearless Transmission
Left hand drive—Centre control
Complete equipment

A Comparison Proves the Value of this Car

The intrinsic value of any article is easily determined by comparison. This Model 46 Series C Lambert is unusual as compared with any other car in its price class.

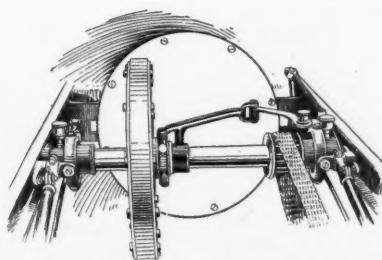
Plenty of room to seat five passengers comfortably—rich, deep upholstery—long wheel base—electric lights and starter—Lambert Patented Gearless Transmission—and so far as the motor is concerned—take your choice of those two known favorably the world over—the Continental or Rutenber.

And the price is \$1200.

The big Lambert organization—big machine shops—skilled mechanics—real knowledge of manufacturing, has made it possible.

It's worth while to know more about this car.

This Simple Gearless Transmission



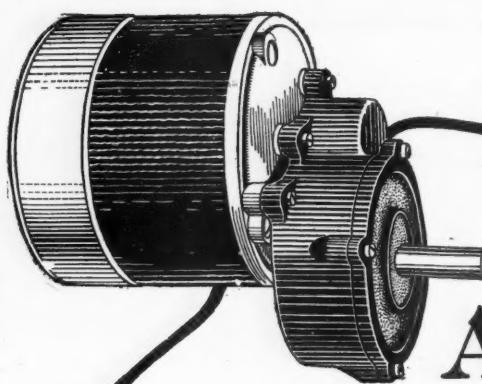
—eliminates the expensive, clumsy, unmechanical, racket-producing gearset, which, having reached the limit of its development, is still far from perfect. The present tendency to pile on so-called improvements on the sliding gear transmission in the form of electric and pneumatic speed changing devices only affords greater proof of its weakness.

The Lambert Gearless Drive eliminates all this complication and expense—gives you maximum service at minimum cost.

The Specifications of this Car Includes—

Continental or Rutenber motor—Lambert patented gearless transmission—Electric lights and starter—Reynolds silent chain drive—Titanic non-breakable front springs—Full elliptic rear springs—112" wheelbase—Briggs magneto, guaranteed for life—Mohair top and cover—Windshield—Speedometer—In fact everything required to make a complete car for touring—and the price is \$1200.

THE BUCKEYE MANUFACTURING CO.
154 Columbus Avenue, Anderson, Indiana



Overdue Announcement!

Manufacturers and Owners:

This is an answer to the question which has been asked us by many: "Why are you not selling a complete starting system? It is generally acknowledged that, by the invention of the famous Magnetic Shunt of the Wells Generator, you have solved the biggest problem in electric starting—control of current. You are making a mistake in not taking advantage of this."

We were not making a mistake and we knew it. What we were doing was taking advantage of the mistakes of others in a new field, to develop a starting system which was right. We now announce the completion of a starting motor which we are proud of, one fit to go with the Wells Generator which we have always been proud of.

The two in combination constitute the Wells Electric Starter, which we believe to be possessed of the four greatest virtues that an Electric Starter may lay claim to. The

WELLS ELECTRIC STARTER AND LIGHTING SYSTEM

has these four great merits: *1st*, it spins the engine from 75 to 175 r. p. m. *2nd*, it is very easy on the storage battery, due to the Magnetic Shunt of the Generator, which insures the maintenance of a high degree of charge in the battery. *3rd*, it is economical and efficient in its use of current. *4th*, it has a 6 volt motor, which permits the use of a 6 volt battery and standard 6 volt lamps. In addition to this, it is light in weight, small, compact and neat in design and is easily adapted to any motor or chassis.

Of course, the Wells Generator, as is well known, supplies plenty of current for both starting and lighting.

MR. MANUFACTURER, THE PRICES ARE JUST AS INTERESTING AS THE GOODS. ASK FOR ESTIMATES.

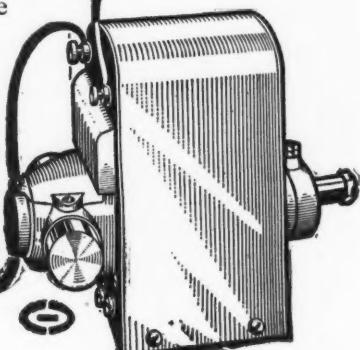
WELLS GENERATOR

for electric lights is the only system containing the famous Magnetic Shunt which solves the problem of current control—really the one great automobile-electrical problem. The Shunt is not an external contraption, but is part and parcel of the Generator and never requires attention. The Wells is light in weight and light in price, and can be installed on any car now in use. Write us.

MASTER VIBRATOR

especially for the FORD. Gives a fat hot spark right "on the dot," and therefore increases engine efficiency and fuel economy—not to mention time, temper and nerve troubles. If you're only human you can't possibly adjust four separate vibrators. Don't try. Learn what your FORD motor can really do! Write for name of dealer near you or send us \$10.00.

R. C. WELLS MANUFACTURING CO.
Wells Building, Fond du Lac, Wisconsin



Overland

\$950

Completely equipped
With electric starter and generator—\$1075
Prices F. O. B. Toledo

ALL raw materials cost the largest buyer less. One of the recent monthly averages on incoming freight at the factories of the Willys-Overland Company was 85 carloads a day—over 2500 tons!

Can you grasp the economy of such purchasing power?
Is it any wonder we can buy and sell for less?

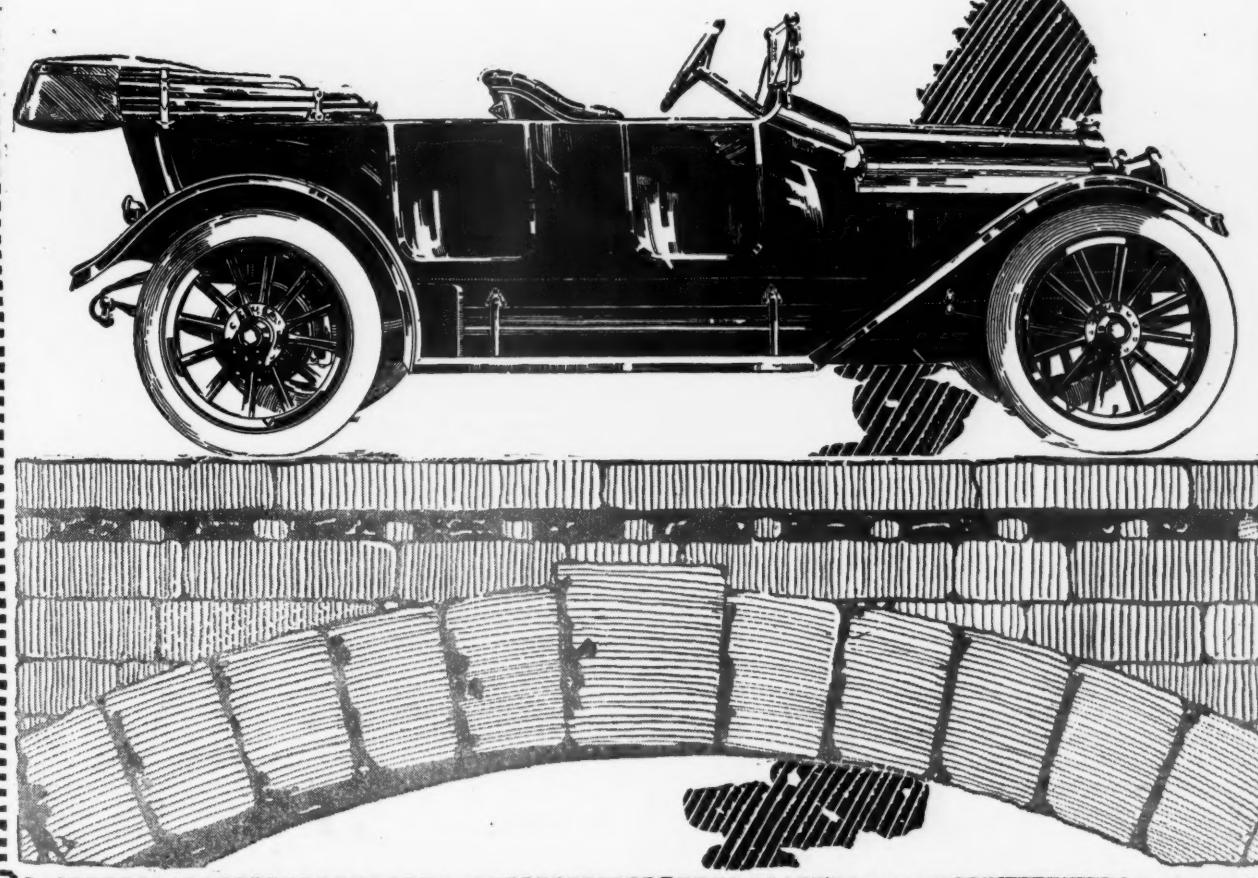
Catalogue on request. Address Dept. 46.

The Willys-Overland Company, Toledo, Ohio

35 horsepower
114-Inch wheelbase
Electric head, side and tail
lights
Storage battery

Three-quarter floating
rear axle
33 x 4 Q. D. Tires
Cowl dash
Clear vision windshield

Mohair top, curtains and boot
Stewart speedometer
Electric horn
Flush U doors with dis-
appearing hinges





A 1914 Car That Meets ALL the Demands of Dealers and Owners

This year, more than ever before, does the Chalmers fully meet the ideals of both dealer and public of what a motor car should be. It contains every feature that motor fashion demands. Dealers have only to show the wonderful new Chalmers "Six" and its sale is assured.

This car more than meets the expectations of the experienced motorist and all prospective buyers who are looking for big value. A big, powerful and beautiful motor car, driven by a master motor—car equipped with every comfort and luxury that the most critical motorist could ask.

This Year Chalmers Cars Sell Easier Than Ever Before

In every way—quality, construction and price—the Chalmers measures up to the careful buyer's standard of value. Never before has such a car as this new Chalmers "Six" been offered for less than \$3,000. Yet this splendid car sells for \$2,175.

We have on our books at this time more orders for this new "Six" than we have ever had for any other Chalmers model, for never before has a car achieved such a name for itself as has the new Chalmers "Six" in the short time since its announcement.

It Took Two Years of Hard Work to Produce the Master "Six"

The 1914 Chalmers "Six" is a new car—new from the ground up. It has a different design from any other car; it has a new motor—a smooth running, powerful motor—that delights the heart of anyone traveling behind it.

It has taken two years of hard work to produce this new "Six." We have drawn from the experience of the whole world in building the new "Six"; and we have tested every feature through many months and thousands of miles of the roughest usage.

The new Chalmers "Six" is ahead in its powerful, vibrationless motor, its non-jerking cork insert clutch, its quietness and wonderful flexibility, its streamline bodies and in its electric lights and electric starter.

The Chalmers-Entz starter—built complete in the Chalmers shops—is a marvel of simplicity. One move of a switch and the motor starts. And this starter absolutely prevents any stalling of the motor. It is one of the things that is making the "Six" sell itself—one of the many things that will make 1914 a most profitable year for the dealers that sell Chalmers cars.

Features That Compel Sales

We believe that the Chalmers "Six" has features that every wise motorist today demands—qualities that are only made possible by the following:

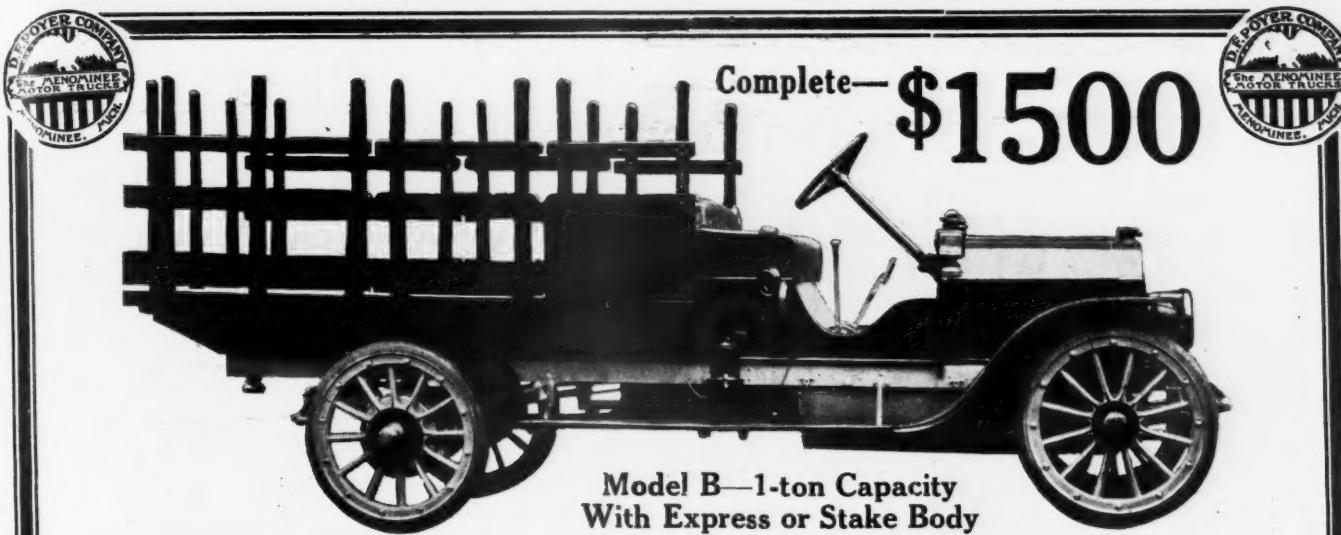
Non-Stallable Motor
 Left Side Drive—Right Hand Control
 Six Cylinders—all moving parts enclosed
 Valves of Chalmers Tungsten steel
 Electric Starter—Silent Entz System
 Clean Running Boards
 Gasoline Tank—leak-proof, rear suspension
 Wide Doors—Fitting Flush—no mouldings
 Streamline Body—Tapering bonnet
 Molded Oval Fenders
 Four Forward Speed Transmission
 Eleven Foot Wheel Base
 All Bodies Interchangeable
 Electric Driving Lights—high and low power
 Big Tires 36 in. x 4½ in.—Underslung Springs
 Continental Demountable Rims
 Concealed Electric Vibrator Horn
 Chalmers Silk Mohair Top
 Quick-Acting Storm Curtains
 Genuine Rain-Vision Wind Shield
 Warner Speedometer

Prices.

Roadster	\$2175	Six Passenger	\$2275
Four Passenger	2175	Coupe	2850
Five Passenger	2175	Limousine	3600
Fully equipped, f. o. b. Detroit. All Bodies Interchangeable. Five Wire Wheels \$80 extra.			

Chalmers Motor Company, Detroit

When Writing to Advertisers, Please Mention Motor Age.



Complete—\$1500

Model B—1-ton Capacity
With Express or Stake Body

"The Menominee" Trucks FOR ECONOMY

MORE MENOMINEE 1-ton trucks are in use today than any other make of 1-ton truck in the same price class.

MENOMINEE 1-ton trucks not only take the place of horses but pay for themselves, in increased business and added delivery efficiency. We can show you testimonial letters from men in all kinds of business, in all parts of the country, substantiating this statement.

You don't have to pay more than \$1,500 for a full grown 1-ton truck—economical in up-keep, durable in construction, untiring in service. Let us send you further reasons why MENOMINEE Trucks are considered one of the best "buys" in the commercial field. Use the coupon.

Note These Specifications

MOTOR: 30 H. P. four cylinder (4 x 4½) fitted with governor.
WHEEL BASE: 122 inches. Front.
FRONT AXLE: I-beam, 2½ x 1¾ inches, drop-forged.
REAR AXLE: Full floating nickel steel, live axle shafts.
CARBURETOR: Schebler.
TRANSMISSION: In unit with motor. Selective type 3-speeds forward and 1 reverse. Special reduction gear. Nickel steel driving shaft.
CLUTCH: Tempered discs so arranged that a stream of oil is thrown on them at all times while motor is running.
LOADING SPACE: Express body 102 x 46 inches. Stake body 102 x 60 inches.

CARRYING CAPACITY: 2000 pounds.
OILING SYSTEM: Automatic and a combination of force and gravity feed.
SPRINGS: Front, semi-elliptic, 2½ x 40 inches. Rear, platform, three point suspension, 2½ x 42 inches.
FRAME: 4 inch heat treated channel steel.
CONTROL: Hand levers located in center of car.
STEERING GEAR: Adjustable worm and segment.
RADIATOR: Vertical tube.
BRAKES: Internal and external expanding.
WHEELS: 34 inch, artillery type.
TIRES: 34 x 3½ detachable, solid rubber.
EQUIPMENT: 2 gas head lights and generator. Two side oil lamps; one tail lamp, horn, jack, and tool kit.

DEALERS: MENOMINEE 1500 lb. Trucks at \$1200, 1-ton trucks at \$1500, and 1½-ton trucks at \$1950, put a dealer in position to close with 90% of the truck prospects in his territory. We have some choice territory still open. We can make immediate deliveries. Write for generous agency proposition. Use the coupon.

D. F. Poyer Company
Menominee, Michigan



When Writing to Advertisers, Please Mention Motor Age.

D. F. Poyer CO., Menominee, Mich.
(COUPON)
Gentlemen:
I am interested in "The MENOMINEE" Motor Truck.
Name
Address
If a dealer check here

64,000 FORD OWNERS USE

The Master Vibrator

and advise all other Ford
owners to do so too



Price, \$15.00

Because they know from experience that the K-W Master Vibrator increases their car's efficiency, as it does away with the separate vibrator adjustments, giving one good, fast vibrator in place of them, which insures absolute synchronism, besides giving a hotter spark, less carbon deposits and cleaner spark plugs, all of which help increase the engine's power, smooth running, and makes starting easier, besides giving that "satisfied feeling."



Follow the example of these 64,000 Ford owners and you will agree with them that the K-W Master Vibrator not only increases the car's efficiency but IS AN HONEST ARTICLE AND WORTH EVERY CENT ASKED FOR IT.

Write for folder O.

← The Standard By Which All Others Are Judged

OUR GUARANTEE—Try the K-W Master Vibrator for 30 days and if you can get along without it, return it and we will give you your money back and ask no questions

Low in Price and Mighty Powerful

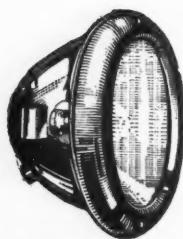
THE



ELECTRIC HEADLIGHT
OUTFIT

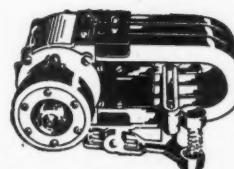
Complete Outfit, Electric Generator,
Head Lamps, Switch, Wire and Bulbs

\$40

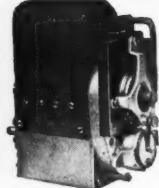


The right outfit for the old or new car cuts charging expenses down three-fourths on battery equipped cars, because it lights the head-lamps direct, without any complicated connections and at practically no up-keep cost. IT'S THE POWERFUL DRAW OF THE HEADLIGHTS THAT EXHAUSTS A BATTERY SO QUICKLY.

It brings the old car "Up to date" as it increases both its appearance and efficiency as well, at the least possible cost. It can be used for ignition as well as light. The Generator alone is but \$25.00. Send for folder P.



We also make a FORD OUTFIT FOR FLY-WHEEL MAGNETO, \$15.00



The High Tension Magneto

The strongest made for the largest engine made. Positive results and entire satisfaction guaranteed. Give description of engine and ask for price. You can't make an engine too big for the K-W. No batteries needed to start.

Give the
Street Number → 2835 CHESTER
AVE.

THE  IGNITION CO.
CLEVELAND, OHIO. U.S.A.

Agents in principal cities.

NEW YORK, E. J. Edmond, 1783 Broadway

BOSTON, W. J. Forbes, 243 Columbus Ave.

We prepay the express all the way on the
K-W Master Vibrator and East of the
Mississippi River on all our other goods
when cash accompanies the order.

Jackson

*No Hill Too Steep,
No Sand Too Deep*

Three Models for 1914 Put Competition on the Defensive

In the whole Automobile industry there is not another maker who offers a surer profit-producing, business-bringing line. Three great models ranging from the wonderful value of the "OLYMPIC FORTY" at \$1385 to the big, high-powered "SULTANIC SIX" at \$2150.

Here is a line that will build *you a permanent business* backed by a manufacturing organization that will help you *increase your business* as they have your own.

Consider that this is the *Twelfth JACKSON Year*. Twelve years of conservative development: Twelve years of superior mechanical construction. Twelve years of constant improvement that has kept JACKSON cars in the forefront.

A Trio of Winners for 1914

Olympic—\$1385

115-inch wheel base and wide seats; full 40 horse power; beauty of design second to none; full elliptic springs front and rear; smooth, quiet running closely approaching *silence*; electric cranking and lighting, and complete general equipment. Only \$1385.

In the JACKSON line you have the cars that take the heart out of competition, because—

Not only are they equal or better as regards size, power, equipment and finish, but there are distinctly superior qualities in JACKSON cars that cannot be described by figures of size or by specifications.

Old JACKSON dealers know all this. An increasing business from year to year is their best evidence and proof of JACKSON popularity.

For 1914 we have increased our production. That means an opportunity for a few more dealers to take on the JACKSON line.

Majestic—\$1885

Long stroke, four cylinder motor, 4½x5½, 45 horse power, electric cranking, wheel base 124 inches. Tires, 36x4. Full elliptic spring suspension front and rear. Full floating rear axle. Extra roomy body. Wide seats, wide doors, 10-inch cushions. Completely equipped. \$1885.

Sultanic—\$2150

Long stroke, six cylinder motor, 55 horse power, electric cranking. Wheel base, 7-passenger, 138 inches; 5-passenger 132 inches. Tires 36x4½. Full elliptic spring suspension front and rear. Full floating rear axle, ball bearing throughout. Completely equipped. \$2150 and \$2300.

Here and there, throughout the country, we can give a contract to the right kind of representative. If *your* territory is open, it's a chance to get behind a permanent business-building product backed by an organization with twelve years of success.

Right now, write or wire us and we will tell you in detail all about the JACKSON proposition



Jackson Automobile Company, 1207 E. Main St., Jackson, Mich.

Why Our Sales Increased Over 400% In Two Years

You Can't Beat This Equipment at Twice the Price

- 1—Automatic Dynamo Lighting System
- 2—Motor-Driven Tire Pump
- 3—Unit Power Plant
- 4—Long Stroke Motor with Enclosed Valves
- 5—Center Control
- 6—Left Side Drive
- 7—Electric Side Lamps in Dash
- 8—Electric Head Lights and Tail Lamp
- 9—Westinghouse Electric Self-Starter
- 10—Floating Rear Axle with Pressed Steel Housing
- 11—Demountable Rims (Baker Bolted-on)
- 12—118-inch Wheel Base
- 13—Goodyear No-Rim-Cut Tires

Glide

THE approval of dealers—the approval of users—has given the *Glide* car a remarkable boost in sales and popularity during the last two seasons. This approval, for one thing, is founded on the fact that the *Glide*—from radiator to tail light—lacks nothing essential to the performance of the car or the comfort of the passengers; that it has **strength** (endurance) to take steepest hills, go over all sorts of roads without wavering; that it has **power** (speed) ample to keep it ahead of the crowd, and plenty in reserve; that it has **appearance** (lines and finish) which places its value far above the low price asked for it.

Another thing, the *Glide* appeals to both classes of buyers—the man who wants a better car at a lower price—the man who wants a car he can be proud of, regardless of price.

Dealers Are Invited to Write Us for agency in their locality. The selling possibilities that a *Glide* dealer has a car that his competitor can't touch in quality or price. Catalogs free.

THE BARTHOLOMEW CO. 215 GLIDE STREET PEORIA : ILLINOIS

\$1840

Write
Us
for
Agency

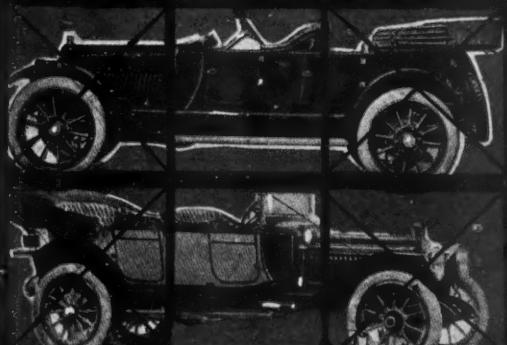
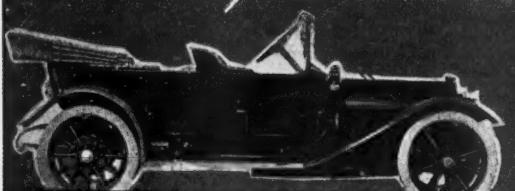


Model 36-43, Five-Passenger Touring,
Fully Equipped. With Electric Self-Starter.

It is a feat to break the ball of a

HESS-BRIGHT

Annular Bearing!



STRENGTH IS ITS INHERITANCE

Every Hess-Bright (D. W. F.) Ball is endowed with all the strength that scientific knowledge can suggest and practical experience can produce.

Hess-Bright Balls are extremely tough and **HARD**. The steel from which they are made is subjected to the most searching chemical, physical and mechanical tests.

This means **DURABILITY—LONGER LIFE—LESS REPAIR COST**.

THE HESS-BRIGHT MANUFACTURING COMPANY

MAIN OFFICE AND PLANT:

Front Street and Erie Avenue

Philadelphia, Pa.

STORES FOR RETAIL DISTRIBUTION:

PHILADELPHIA 666 N. Broad Street

NEW YORK 1974 Broadway

CHICAGO

1800 Michigan Avenue

One little 7/16" Hess-Bright (D. W. F.) Ball could support the weight of three 5000 lb. automobiles without breaking or even crushing.

A New and Remarkable Demountable Rim

60 is its first name—Stanweld its last. It is truly a remarkable rim—the first demountable rim to have endless side-flanges that do not have to be removed from the casing when making tire-changes or repairs.

Think what that means—the elimination of the last objectionable feature of tire changing. And both side-flanges are endless—no rough points or edges to chafe or cut the casing.



INNER-BAND REMOVED—SIDE-FLANGES UNDISTURBED

Others have said, "It is impossible to design a satisfactory demountable rim with endless side-flanges that need not be removed from the casing when changing tires." Yet, we've done it. Witness the Number-Sixty.

It has taken a long time to perfect the Number-Sixty. Test-sets have been in operation many months. They operate today as easily and quickly as when first applied.

Also, the Number-Sixty is a light rim—exceptionally light.

It is a strong rim—remarkably strong.
It is a simple rim—decidedly simple.

It is a safe rim—absolutely safe.

And it is an easy rim to operate—so much easier than any other demountable rim that we expect it to supplant all other types.



COLLAPSING INNER-BAND

Freezing of tires to side-rings means nothing to the owner of Number-Sixty Stanweld Rims—because the side flanges don't have to be removed from the casing until you're ready to throw it in the discard.

The Number-Sixty demounts same as the Number-Forty—the surest, quickest demounting mechanism ever devised.

STANWELD RIMS

Then to remove the tube, all you have to do is collapse the inner band—an operation that takes much less than a minute.

The Sixty is made in both clincher and straight-side styles. Only difference is the shape of the side-flanges. Both styles fit the same base.

It surely will be to your advantage to see and inspect this remarkable new rim before ordering or specifying any other type.

We're prepared to take care of the demands of the trade—manufacturers, jobbers, dealers and repairmen. Better get prices and full information—now.

The Standard Welding Company

Pioneers and World's Largest Producers of
Motor-Driven Vehicle Rims

Main Office and Factory

CLEVELAND

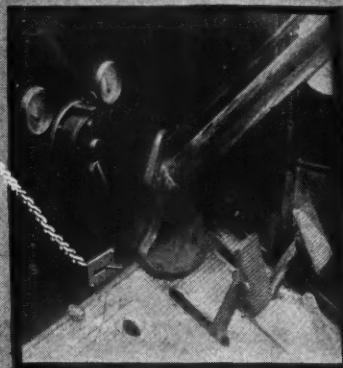
Branch Offices in

NEW YORK U. S. Express Bldg.

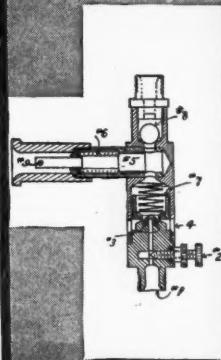
CHICAGO Peoples Gas Bldg.

DETROIT Ford Bldg.

Distributors in Principal Cities of the United States



—No Priming Needed—the **EXTRA-JET** Makes Starting Easier



No wise motorist today overlooks any device which will increase the efficiency of the car he drives; and of course every motorist is willing to install a device that will decrease his cost of up-keep.

THE EXTRA JET INCREASES EFFICIENCY AND SAVES MONEY

It is practically an extra jet for your carburetor, which supplies a rich mixture for starting and enables you to set the carburetor for correct running mixture; it will start your motor on the third or fourth pull even in zero weather. With electric starters it saves batteries and wear on the starter, in addition to fuel economy and elimination of priming. The Extra Jet is very simple in construction, and is easily attached; no soldering or machining required. Nothing but a small lever is seen on the dash. Try it for ten days. So necessary a part of your car will it become that you'll never part with it.

Price \$5.00, Complete

Your money back if not satisfied. Write for circular—NOW

Dealers: Here's something new that sells easily and leaves a handsome profit. Get a sample today

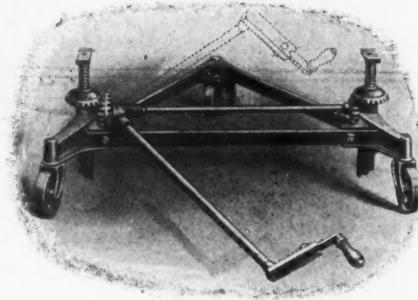
WELD MFG. COMPANY, North Chatham, Mass.

Exclusive Western Representatives: Butler & Mattison, 608 S. Dearborn St., Chicago, Ill.

Test Your Brakes



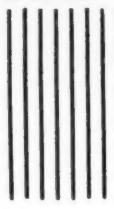
with
WEAVER



Auto Twin-Jacks

THE proper adjustment of the brakes is one of the most important factors in the proper care of a car. Yet how many car owners are equipped to test their brakes without a great deal of trouble and inconvenience? Weaver Auto Twin-Jacks will enable you to do it in a minute's time. They also give you all the service of a ball and roller bearing—

**Turn Table
Transporting Truck
Tire Rests and
Lifting Jacks**



Mr. Car Owner—Think what a saving in time and labor you would secure if your garage was equipped with all these conveniences. Then think of securing this complete equipment for only \$20.00. The tire saving will pay for it.

Two for \$20.00

AT YOUR DEALERS—OR DIRECT FROM

Weaver Manufacturing Company, Springfield, Ill.

When Writing to Advertisers, Please Mention Motor Age.

The ENGINE DOES the WORK

LET IT PUMP YOUR TIRES

Why on earth do you still bend over that hand-blistering back-breaking hand pump? Why do you perspire for fifteen minutes inflating a tire—and then not have it hard enough—when by merely connecting a tube to the tire you can in two or three minutes have it correctly inflated? It's easily, simply and quickly done with a

MANZEL ENGINE DRIVEN TIRE PUMP

One tire in every three is ruined by rim-cutting. The MANZEL TIRE PUMP keeps tires properly inflated and increases life of tire 25%. The MANZEL is a two cylinder pump that is guaranteed to do the work of any four-cylinder pump on the market. The largest tire can be inflated in less time than it now takes to locate the hand pump.

Once attached it becomes a permanent feature of the car. There are few wearing parts. It can be attached to any car having an exposed shaft. It is very accurately built. That 9,000 Cadillac Cars are equipped with the MANZEL PUMP is proof of its scientific rightness and mechanical perfection.

Surely if you've adopted in succession each convenient and labor-saving innovation from fore doors to electric starters you cannot afford to overlook the engine driven pump.

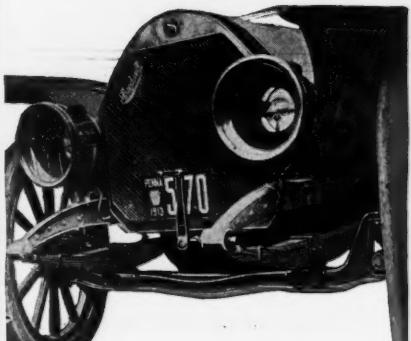
It will increase by ten-fold the pleasure of touring because it takes the terrors from hand pumping. WRITE FOR OUR BOOKLET TODAY.

MANZEL BROTHERS COMPANY

306 BABCOCK STREET
BUFFALO, NEW YORK



MANUFACTURERS
DEALERS
CAR OWNERS
SHOULD
INVESTIGATE IT



Speedwell Equipped
with AMES

The Ames Shock Absorber

Makes Your Own Spring a TWO-WAY SPRING

Its installation with the AMES spacing block produces the proper adjustment for all roads and all conditions. It requires no further attention.

Eliminates jar, vibration, danger of breakage, keeps your tires on the road and you on the seat.

Made in all lengths and widths to correctly equip all springs. Every AMES SHOCK ABSORBER solves a particular spring problem.

Ask Your Dealer or

Clarence N. Peacock & Company
EXCLUSIVE LICENSEES

1788 Broadway, New York, N. Y.

1510 Michigan Ave., Chicago, Ill.



Traffic Conditions Demand Hard, Permanent Roads

Every road must be built for its traffic. Time was when macadam roads were good roads—before the days of motor travel. Now the steady grinding of heavy cars gouges macadam into ruts; the constant suction of motor car wheels rips the binder from the surface.

Concrete Roads

stand up under the wear of heavy motor traffic. Weather conditions do not affect them. Freezing does not make the binder brittle, heat does not soften it. The surface is smooth, hard and dustless; the road is permanent.

If you are interested in good roads, send for our free booklet on the use of concrete in road construction.

UNIVERSAL PORTLAND CEMENT CO.
CHICAGO - PITTSBURGH - MINNEAPOLIS
Plants at Chicago and Pittsburgh
Annual Output 12,000,000 Barrels



Time will tell—is telling—has told in fact, that the

BUDA MOTOR
is "the Part that Sells the Car"

Whatever you can reasonably ask *any* motor to do when **NEW**, you can ask a **BUDA** Motor to do when **OLD**—and *it will deliver the goods without fuss, bother, tinkering or back-talk*. And you can buy **BUDAS** for less than it costs you to make your own. This is only natural—and inevitable. Today is the day of specialists. We have a motor *plant* (one of the largest in the world); all you have is a "Motor *department*."

ASK US ABOUT THIS—AND MORE

THE BUDA COMPANY
Factory, HARVEY, ILL., (Chicago Suburbs)
Address all communications to our **FACTORY REPRESENTATIVES**
BRANDENBURG & COMPANY

1108 So. MICHIGAN AVENUE, CHICAGO 57TH & BROADWAY, NEW YORK, N. Y. FORD BLDG., DETROIT

When Writing to Advertisers, Please Mention Motor Age.



Easiest to apply. Merely clamp coil to frame and secure belting around axle. Nothing to work loose, rattle or wear out. No future readjustment required. Snubbers allow the springs to work naturally on the closing movement, but retard abrupt or excessive expansion; prevent the snappy rebound that jars mechanism and passengers; put a stop to excessive up and down throw of springs.

GABRIEL SNUBBERS

White, Peerless, Stearns, Oldsmobile, Lozier, use Gabriel Snubbers as standard factory equipment.

Over twenty other makes use Snubbers as partial or special equipment.

Snubbers lead in **number** of cars equipped for 1914, just as they have always led in **efficiency**.

Gabriel Snubbers are the recognized standard device for making cars ride easy, cutting down their upkeep expense and increasing their length of service.

Live Agents Wanted

Gabriel Horn Mfg. Co., 1415 East 40th St., Cleveland, Ohio

Makers of the famous GABRIEL Musical Horn and Windshield Cleaners.

This is a
FORD OWNER
trying to find a
pet cock on his motor



He'd be a wiser motorist and a much more satisfied owner if he used

ALL-IN-ONE SPARK PLUGS

A combination of a mighty good spark plug and a splendid priming device. An



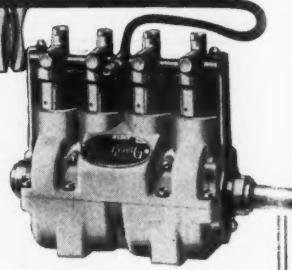
ALL-IN-ONE PLUG, locates missing cylinders in a jiffy—primes the motor quickly—and cleans itself easily.

Absolutely necessary for Ford Cars; highly desirable on all cars.

AT YOUR DEALERS—OR DIRECT

Frontier Specialty Co., Buffalo, N.Y.

Let Your Motor Pump Your Tires



This, Mr. Dealer and Mr. Manufacturer, is the new talking point in selling cars for 1914. Many cars are now evenly matched. Horsepower or wheelbase is little argument. Complete equipment is the clincher. But no car is completely equipped without the

Four Cylinder KELLOGG Tire Pump

The best tire pump made is necessary for proper tire inflation, which tire makers say eliminates most tire repairs. The Kellogg is the standard tire pump, because it is used solely by the makers of better cars. No other can approach it.

Dealers who can offer Kellogg-equipped cars say: "We make the most of our opportunity to talk this stand-

ard pump." Less fortunate dealers should not accept "something just as good" or no pump at all. You can have your cars "Kellogg-equipped," or install them yourself.

Every dealer and manufacturer should write for our book—"Air On Tap." There's money in it for you.

KELLOGG MANUFACTURING CO., Circle and Main Sts., Rochester, N. Y.

NEW YORK
1744 Broadway

SAN FRANCISCO
444 Market Street

CHICAGO
1112 S. Michigan Avenue



Exactitude

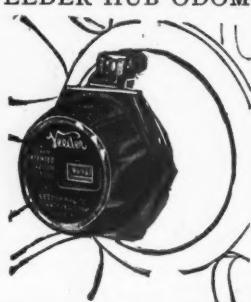
in the mileage of an automobile or motor truck is a primal necessity if you insist upon knowing the upkeep cost of tires, gasoline or "juice" and lubricating consumption. A VEEDER HUB ODOMETER is not only exact but CAN'T BE TAMPERED WITH.

Neat, durable and compact, it can be easily attached. **\$25.00**
Price complete.

At your dealer's, direct from our factory, or at the following agencies:

T. H. Cranston & Co., 56 E. Randolph Street, Chicago, Ill.

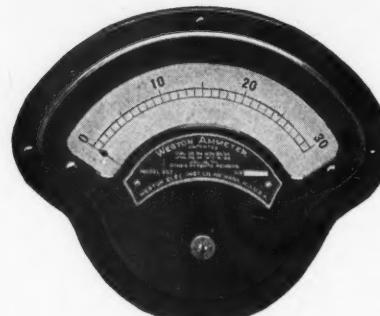
Bernard I. Bill, 543 Golden Gate Avenue, San Francisco, Cal.



The Veeder Manufacturing Company
C. H. VEEDER, President D. J. POST, Treasurer
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HARTFORD, CONN.

Makers of Cyclometers, Odometers, Tachometers, Tachometers, Counters and Small Die Castings

A reliable Electrical Measuring Instrument indicates quality.



Weston Model 267 Dashboard Ammeter

WESTON AMMETERS

for control of Electric Lighting and Self-Starting Systems are the most reliable, durable and highest grade instruments made for this purpose.

Please send for our 30-page bulletin No. 8 describing them

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THE
McKIBBIN
COON
SKIN



Satisfaction
Guaranteed

McKIBBIN Coon Skin Coats

QThe ideal cold weather garment for the motorist is a Fur Coat.

QRaccoon Skin of the highest grade and in its natural color is the present day ideal Fur for Men.

QMcKibbin Coon Skin Coats are made from prime selected northern skins, ample in cut and unequalled in appearance or in their comfort giving qualities. Literally the best coon skin coat that money will buy, for **\$160**

QIf you motor through the winter without one of these coats you are subjecting yourself to an unnecessary hardship. Ask your dealer or send direct to the manufacturers.

McKibbin Driscoll & Dorsey
Saint Paul

The Atwater Kent Ford Ignition

does more than eliminate the frequent and troublesome adjustment of the Ford coils.

The Atwater Kent Ignition assures perfect synchronization at all speeds, eliminating preignition and overheating—starts easily with a quarter turn of the crank and frequently without cranking by means of the starting button on the coil.

Effects a saving in gas, wear and vibration by enabling the motor to run

slowly while the car is standing and run as smoothly "on high" at four miles an hour as at twenty or thirty.

The Atwater Kent will, in addition, wonderfully increase the power, speed, flexibility and hill-climbing ability of the Ford car, and gives superior results and costs less than half that of the high tension magneto.

It consists of the Unisparker or distributor elevated to a convenient and accessible position which takes the place of the Ford timer and a single non-vibrating coil is installed in place of the four vibrating coils.

It is easily installed by anyone who can time a motor—no holes to bore—a screw driver and wrench are the only tools required.

Price, complete with hand-operated switch, \$28.00. Foot-operated switch \$2.00 extra.

For sale by all good jobbers and dealers. Write at once for circular "A"



Atwater Kent Mfg. Works, 4934 Stenton Ave., Philadelphia, Pa.

What We Can't, and What We Do Promise

TRADE-MARK-REGISTERED



Piston Rings

(PATENTED)

Not a "cure-all"—they won't mend leaky valves—they won't re-bore or re-grind cylinders; therefore, we can't honestly or intelligently tell you that irrespective of all other conditions they will increase your power such-and-such a per cent—

But—on the premise that your valves don't leak and that your cylinder is true we **do** promise that throwing out ordinary piston rings and replacing with Leak-Proof Rings will **insure** perfect compression, maximum power and economy in fuel consumption. It will eliminate the leakage of gas (waste power) and minimize carbonization caused by oil getting up into the cylinder through the piston rings.

Leak-Proof Piston Rings are made of Processed Gray Iron, possessing the necessary spring and elasticity, and owing to their construction give equal tension on cylinder walls. Made in all sizes and sold by all up-to-date dealers, garages and repair shops.

Now in Use on 150,000 Automobiles
"Ask the User"

A booklet on request—complete information as to how Leak-Proof Piston Rings can be applied to your piston problems if you'll write us.

Manufactured by

McQuay-Norris Mfg. Co.,^{Dept. H} St. Louis, Mo.

Branch Offices

New York—55 Lincoln Square Ct., Broadway at 64th Street
Chicago—Suite 39, Merchants Building, 106 N. La Salle Street
Pittsburgh—7620 Tioga Street, Kansas City—1504 Grand
San Francisco—164 Hansford Avenue.
Building.
Ft. Worth—108 Bryan Street. Los Angeles—224 Central
Building.

You will be in New York during Show Week?

WHETHER your next visit to New York will be to the big Show—or before—you will make sure of the ideal place to live—by making your reservations at the Hotel McAlpin now.

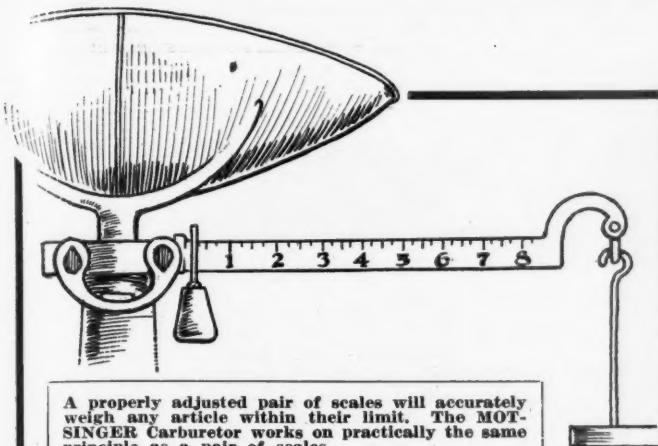
Our guests have every advantage possible in a luxurious, refined home, where personal service is the keynote—with the added advantages of the world's greatest and safest hotel—at prices notable for their moderation.

The exceptional hotel from every standpoint—in accommodations—and in location. Its situation, at Broadway and 34th Street, makes it the central point in the amusement and shopping districts—and it is right at the apex of the transit facilities. Pennsylvania Terminal one block away—Grand Central Station a few minutes' walk.

Its distinctive restaurants—with moderate tariff—are an added factor in its great popularity.

Management of MERRY & BOOMER

HOTEL McALPIN
Herald Square
NEW YORK
Nearer than Anything to Everything



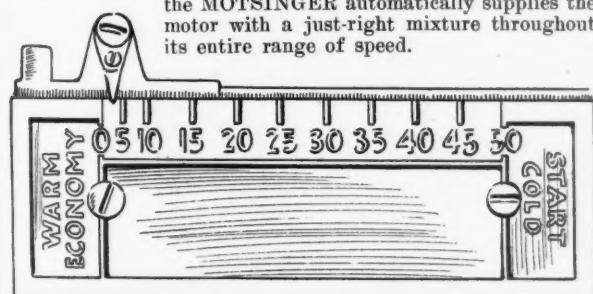
A properly adjusted pair of scales will accurately weigh any article within their limit. The MOTSINGER Carburetor works on practically the same principle as a pair of scales.

"Weigh Out" Any Kind Of Mixture You Want WITH A Motsinger Carburetor increased mileage guaranteed

If you want to weigh three pounds on a pair of scales you set the sliding indicator at mark "3" on the scale beam. If you want to weigh two pounds you shift the indicator back to mark "2." The operation is very simple.

Similarly, with a MOTSINGER Carburetor, when in winter you want a rich starting mixture, you simply shift a steering post lever to mark "Rich," which adjusts the carburetor to weigh out a mixture heavily charged with gasoline.

When your motor has "warmed up" and you wish to get back to a "lighter," more economical mixture, you shift this lever back toward mark "Economy," till a "balanced" mixture is determined. Once this balance is found the MOTSINGER automatically supplies the motor with a just-right mixture throughout its entire range of speed.



This dial on the top of every MOTSINGER Carburetor corresponds to the graduated beam on a pair of scales. By shifting the steering post lever the little indicator "weighs" out a heavier or lighter mixture.

A mechanically perfect air and needle valve construction — unlike that found on any other carburetor on the market—is the reason the MOTSINGER is considered by engineers "The Logical Carburetor."

The Motsinger is guaranteed to increase your mileage or your money refunded. Try one on your car or truck.

MOTSINGER DEVICE MFG. CO.

870 Putnam St., Lafayette, Ind.
Chicago Distributor
O. JUNKERS, 1806 Michigan Ave.



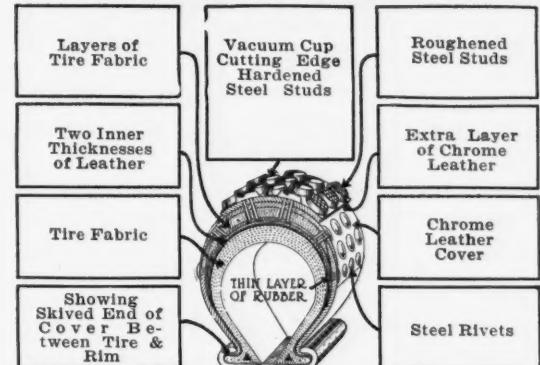
When Writing to Advertisers, Please Mention Motor Age.



GUARANTEED FOR 10,000 MILES

Puncture-proof—Blowout-proof—Skid-proof—Rut-proof—Rim-cut-proof—Oil-proof and most resilient

This shows construction that makes guarantee possible.



A written 10,000 mile guarantee accompanies every tire.

10 Days' Free Trial

To remove all doubt that might arise in the purchaser's mind and to back up our statements we will allow 10 days' free trial on the first set that goes into each town and if these tires are not perfectly satisfactory in every way they may be returned to us any time within 10 days and we will cheerfully refund the entire purchase price.

BEFORE WE PLACE AN AGENCY WE WANT a set of these BRICTSON Tires in each town—who will be the first one to order?

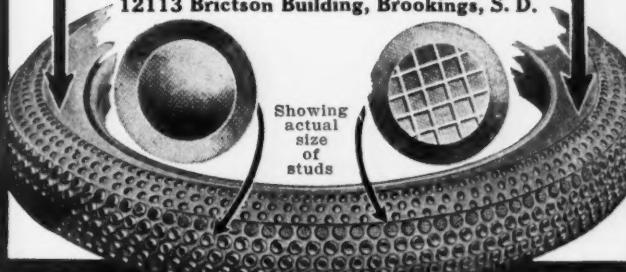
We can rebuild your tires like this

If you are not in need of new tires and the fabric in your present tires is still good, we can rebuild them the BRICTSON way, making them puncture-proof—non-skidding—blowout-proof—and oil-proof and rim-cut-proof.

All the weak points in previous tire construction have been eliminated in the building of the BRICTSON Pneumatic Tires. No motorist can afford to pass by the opportunity to be relieved of all future tire troubles.

For full particulars as to how the Pneumatic Tire problem has been solved, fill out and mail the attached coupon.

THE BRICTSON MANUFACTURING CO.,
12113 BRICTSON BUILDING, BROOKINGS, S. D.



COUPON

The BRICTSON MFG. CO., 12113 BRICTSON BLDG., BROOKINGS, S. D. Without obligation on my part, please send me full particulars about BRICTSON tires, also explain how you can rebuild my own tires the BRICTSON way.

Name.....

Address.....

Dealer's name.....



Take a handful of ordinary grease or oil and close your hand firmly. The grease or oil will squirt out and drop to the floor.

Now do the same with Cook's Lubricant. You cannot squeeze your hand *dry* and the excess grease will hang on.

Now, there is just this much difference between ordinary grease or oil and Cook's Lubricant when used in gear cases or differentials. Cook's Lubricant sticks to the gears and is carried around and around with them. It is always between the teeth.

Dealers all over the country have shown this simple test to customers and have always been thanked for recommending a grease which actually lubricates.

TO DEALERS: Cook's Lubricant is not only easy to sell—but it stays sold and brings repeat orders. That is the kind of a product you are interested in. Write for our "New Dealer's Proposition." Cook's Lubricant Dept.

ALBANY LUBRICATING CO.

ADAM COOK'S SONS, Prop.

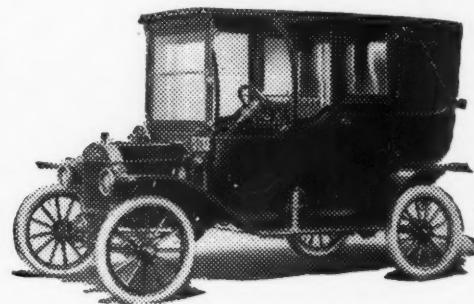
708-710 Washington St.

NEW YORK

103



The lowest-priced, most economical closed car on the market. Six-passenger—4 cylinder—20 horsepower. Price includes two 6-inch gas lamps, generator, three oil lamps, horn and tools, including jack—f. o. b. Detroit. Get particulars from Ford Motor Company, Detroit, Mich.



Ford Model T Town Car—\$750

**"The Acme of Precision—
Is the Warner Transmission"**

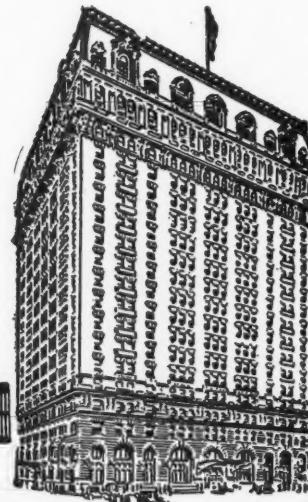
Transmissions ! !

"Our various designs of transmissions involve both light and heavy gear sets of both unit and sub-frame type, their capacity ranging from the lightest of pleasure cars to the heaviest of commercial vehicles."

"Warner Gears—Standard for Years"

WARNER GEAR CO
MUNCIE INDIANA

DETROIT OFFICE - 628 FORD BLDG.



Hotel La Salle
CHICAGO'S FINEST HOTEL

ERNEST J. STEVENS, Vice-Pres. and Mgr.

Located in the heart of the city, within easy reach of all railway terminals

RATES

ONE PERSON	Room with detached bath.....	\$2 to \$3 per day
	Room with private bath.....	\$3 to \$5 per day
TWO PERSONS	Room with detached bath.....	\$3 to \$5 per day
	Room with private bath.....	\$5 to \$8 per day

TWO CONNECTING ROOMS WITH BATH

Two persons	\$5 to \$8 per day
Four persons	\$8 to \$15 per day
SUITES	\$10 to \$35 per day

LA SALLE AT MADISON STREET, CHICAGO

The Benham Steering Gear FOR CYCLECARS



Adapted to
either Right or
Left Steer,
also Center

Adapted to Overslung or
Underslung Cyclecars

Send your specifications and requirements for quotations.
We can make immediate deliveries.

Benham Manufacturing Co.
1882 McElliott Ave.,
Detroit, Mich.

**"There's a mighty
big difference
in lubricators!"**

Don't blame your car for what it can't help. Many a car is inefficient only because its lubrication is bad. Try Badger Gear Compound just once and notice the difference.



BADGER Gear Compound Is "Always on the Teeth"

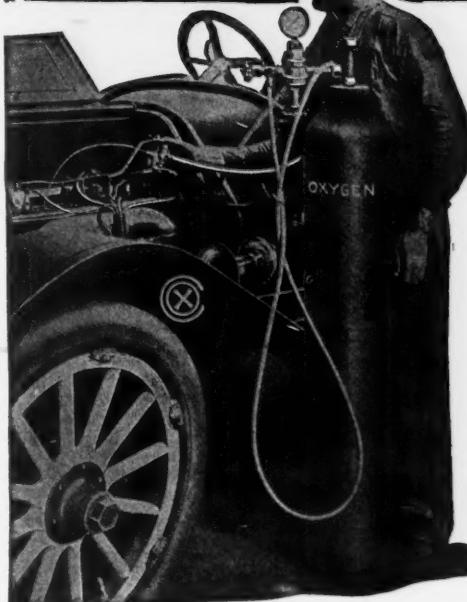
It never runs thin and stays where you put it. Will not pack the sides of the gear case. Nothing like it for minimizing wear and quieting rear axles and transmissions. Every ounce lubricates. Learn more about this power-saving lubricant—also about the popular F. V. Motor Oil and Badger Lubricants. Ask your dealer or write us.



Dealers, Write Us

WADHAMS OIL COMPANY
Milwaukee, Wis.

COX OXYGEN CARBON CLEANER



Cold
Weather
Increases
Carbon
Deposits!

Winter Driving Facilitated

Cold weather calls for thin engine oils. Thin oils frequently cause imperfect or over-lubrication—and it is over-lubrication with incomplete combustion, that produces carbon deposits in cylinders. Carbon deposits cause a lot of trouble which is hard to trace. You can rarely tell, without dismantling your engine, when it is carbon that is responsible for engine faults. Thus it is decidedly important that cylinders should be cleaned of carbon at regular intervals, to assure maximum of efficiency with minimum of trouble.

And the most complete and thorough, while least expensive method for doing this is by use of a

Cox Oxygen Carbon Remover

No taking down engine! No half-finished scraping of cylinders and pistons! No tying up the car for a day or more! The work is done quickly—within 6 to 10 minutes per cylinder. It is done completely. The oxygen removes the carbon, to the smallest detail and from every nook and corner—even to the pores of the metal. **Taxicab, Motor Truck and Large Private Owners** will find this a means of not only saving money but also of easily and constantly keeping the cylinders of their cars in excellent condition. For them, one Cox Oxygen Carbon Remover will pay for itself many times over.

GARAGE OWNERS can make it pay a handsome dividend—while doing the work for their customers in much less time and with far better results. Owners can afford and will have you clean their engine cylinders frequently when they know it costs little, takes only a short time and will do the work right. The Cox Oxygen Carbon Remover has paid for itself twice over in one week—and can do the same for you!

Send for full information

Outfit complete (without tank) only \$25.00

Cox Brass Mfg. Co. Albany, N. Y.

1777 Broadway
New York City
3445 Michigan Ave.
Chicago, Ill.
870 Woodward Ave.
Detroit, Mich.

Gentlemen: Please send me full information about the Cox Oxygen Carbon Cleaner.
Name: _____
Address: _____
City: _____
State: _____
M. A. 11-13



"Heaven Only Knows"

Where we would have been if we had not been just lucky enough to have the Pyrene extinguisher at hand. The fire was put out in the twinkling of an eye and the demonstration removed all doubts from our minds."

"Kindly send us seven more of your extinguishers with fixtures."

So writes Mr. Edward Callan, prominent dry goods and furniture merchant, Third Avenue and 121st Street, New York City, after a Pyrene Extinguisher had successfully saved his large ton and a half motor truck.

The one agent of certain protection for motor car or truck is Pyrene—"The most efficient fire extinguisher known."

For full information write for booklet.



FIRE EXTINGUISHER

Brass and Nickel-plated Pyrene Fire Extinguishers are the only one-quart fire extinguishers included in the lists of Approved Fire Appliances issued by the National Board of Fire Underwriters.

Pyrene Manufacturing Co.,

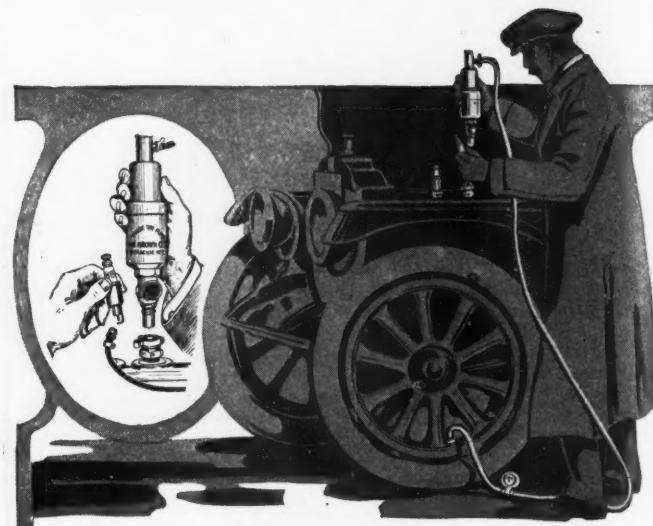
1358 Broadway
New York City

BRANCH OFFICES:

Alton	Cincinnati	Honolulu	Norfolk	St. Paul
Atlanta	Cleveland	Jacksonville	Oklahoma City	Salt Lake City
Baltimore	Dayton	Louisville	Phoenix	San Antonio
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PACIFIC COAST DISTRIBUTORS:

Gorham Engineering Co.—San Francisco, Los Angeles, Seattle
Distributors for Great Britain and the Continent: The Pyrene Company, 29A Charing Cross Road, London, W. C.



The Brown Impulse Tire Pump

with the
B'Co Q. D. Spark Plug

Means tire inflation with all the hard work and backache left out. Your motor does the work.

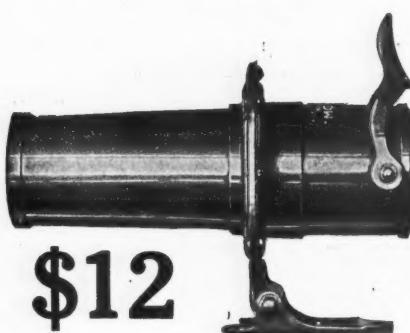
Means proper inflation and greater mileage from your tires. Attached and detached with your two hands, no wrench, no broken spark plugs.

Pump complete, including Plug.....	\$15.00
Extra Spark Plugs.....	1.50
Previous Brown Pumps made over to fit these connections	2.00

THE BROWN CO., 120 Bellevue Ave., Syracuse, N. Y.

MOTOPHONE

A Mechanically Operated Horn



\$12

NO Adjustments
Motor Troubles

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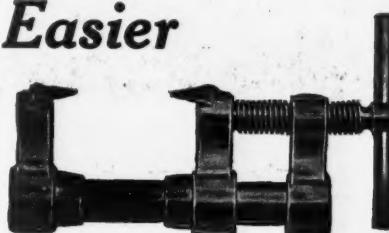
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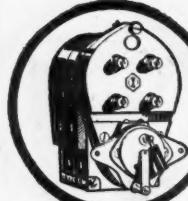
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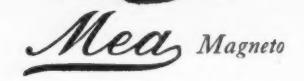
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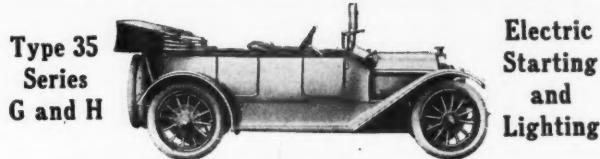
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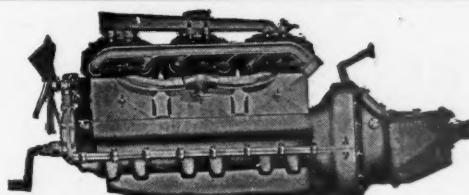
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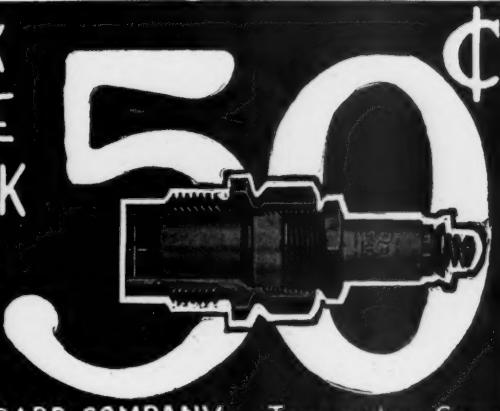
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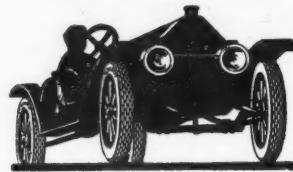
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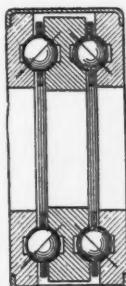
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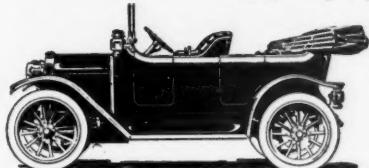
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MOTOR CARS

5-Passenger Touring
F. O. B. Detroit.....\$2485

Every Part Is Standard and the Best in Quality

Strong Features:

Continental Six-Cylinder Motor.
Mayo Honeycomb Radiator.
Timken Axles and Bearings.
Brown-Lipe Transmission.
Gemmer Steering Gear.
Jesco Lighting and Starting.
Warner Speedometer.
Rostand Windshield.
Full floating rear axle, aluminum hood, 130 in. wheelbase, left hand drive, etc.

S. & M. MOTOR CO., Inc., Detroit, Mich.

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Henderson
De Luxe, \$1785



We have some interesting facts in connection with increasing your car sales and profits.

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COVERT
Covert Motor Vehicle Co.
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Three Great Models— Pilot 50—4 cylinder, 4½ x 6—59 H. P.—120 inch wheelbase, roadster and touring car—\$2250. Pilot 50—roadster—4, 6, and 7 passenger bodies, 126 inch wheelbase—\$2500. Pilot 60—6 cylinder, 4x6, brake test 67 H.P., 132 inch wheelbase, roadster, 4, 6, and 7 passenger touring cars—\$2785.

THE CAR WITHOUT A MECHANICAL DEFECT

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"Imperial Twelve" Garage Compressors

A high-class car equipment deserves high-class garage equipment. The quality of these little compressors is such as to appeal to the most discriminating buyers.

Booklet 608

Ingersoll-Rand Co., New York, London

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The only medium priced six that is not a new untried model

Better Than The Price
\$2590

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Satisfaction Guaranteed or your money refunded.

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When your car is equipped with it you'll begin to enjoy motoring as you never have before. Its lights have a fog and dust piercing ray that takes all the nerve-strain out of night riding. Send for full particulars.

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Gyroscope Principle

The New Jones Speedometer Unaffected by Heat or Cold

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Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, tests and experiments that show Jones supremacy beyond question. Then specify what speedometer you want on your car this spring.

The Jones Speedometer

Broadway at 76th Street
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KEATON NON-SKID TREAD
has four times the wearing service of the ordinary non-skid. Users will tell you that they have run Swinehart Keaton Non-Skid Tread Tires a whole season without having them lose their anti-skid effectiveness. Call at any one of our stores and investigate them. We also make a complete line of Smooth Pneumatic Tires of best quality. Branches and distributing agencies in all leading cities.
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This epoch making automobile with VULCAN ELECTRIC GEAR SHIFT & WIRE WHEELS priced at only \$2400.

Fours and Sixes—\$1775 to \$2850

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Including Electric Starting and Lighting System

This model has made the Paige reputation. Such a sturdy, powerful, comfortable car has never been offered the public at anywhere near its price. \$975.00 with complete equipment.

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Fitted With HOUK Quick
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Make for greater resiliency, smoother riding. Save tires. Are quickly and easily removed. Practically indestructible. Absolutely rust-proof. Now being manufactured in America by the Standard Roller Bearing Company, of Philadelphia.

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Find out more about them. It will make a tremendous difference in the riding qualities of your car.

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Next Best—Special Analysis

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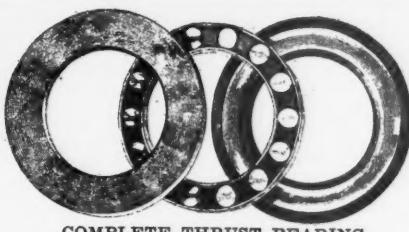


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Manufacturers of Radial Ball Retainers, Thrust
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R. E. Olds' famous car—the leading car in its class. The latest model sells at \$1175, completely equipped—electric starter and electric lights. 30 to 35 horsepower.

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Backed by 15 years of specialization. Found on more high-grade cars than all other makes of lamps.

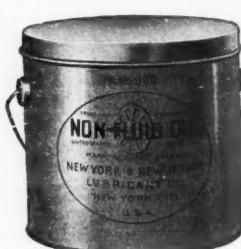
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NON-FLEAB OIL
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because your car is NEW, than to have to do so because your car is prematurely OLD.

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Six Cylinder, 65 H. P.
Equipped with Vulcan
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Our advertising campaign will send a buyer into your showroom more than half convinced that he should own a Haynes; the sale, however, results only from a successful demonstration; it is our firm belief that as a Haynes dealer you possess more than a sufficient number of convincing arguments to make every demonstration result in a quick and profitable sale.

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METZ "Twenty-Two" Roadster

1914 Improvements

THE GEARLESS CAR
"No clutch to slip—no gears to strip."

\$475

Completely Equipped

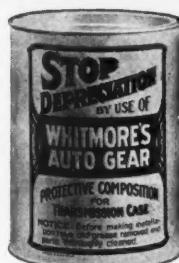
Center control, left-hand drive, 4-cylinder 22½ H. P. water cooled motor, Bosch magneto, standard artillery wheels, best quality clincher tires, extension top, windshield, five lamps, gas generator, tools, etc. Makes 5 to 60 miles per hour on the high speed, 28 to 32 miles on 1 gal. of gasoline, climbs hills as fast as ANY stock car made. A strong, reliable, stylish, fully guaranteed car. You can secure EXCLUSIVE SALE in your territory. Write at once for Book "K" and particulars.

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A Drop of Water
will suffice to puncture the film of ordinary lubricating products.
Moisture Has no Effect on Whitmore's Auto Gear Protective Compositions.

It gives a maximum of protection against corrosion to polished steel parts.

In ordering Whitmore's Compositions, state definitely for what part of car lubricant is wanted.

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HESS Axles have been on the market but 2 years. Fourteen car manufacturers in that short time exclusively adopted them as regular equipment.

Renewals of HESS contracts for 1913 from past users and an increasing HESS demand among new manufacturers, is ample proof of the stability of HESS Quality.

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Cartercar

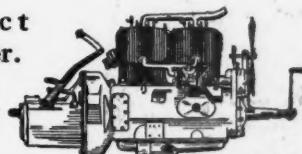
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The simplest car made—
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Twice the usual tire mileage.
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We never over contract our ability to deliver.

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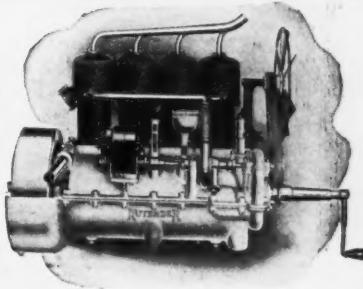
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Standard or Unit and

4 x 4, 4 1/2 x 5 and 4 3/4 x 5
Standard Types. All L
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Combines highest lubricating effects with lasting quality.

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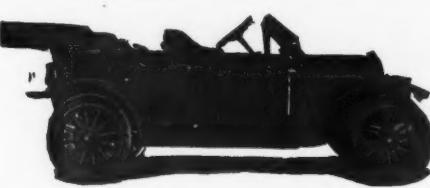


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America's most comprehensive line. Every car completely equipped. 3 sizes chassis—10 body styles. Price range from \$925 to \$1495

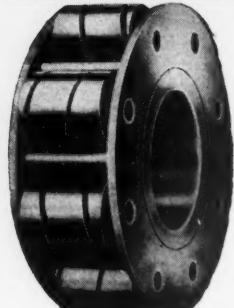
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Lead the world in quantity of production. Twelve mammoth factory buildings required to supply the demand.

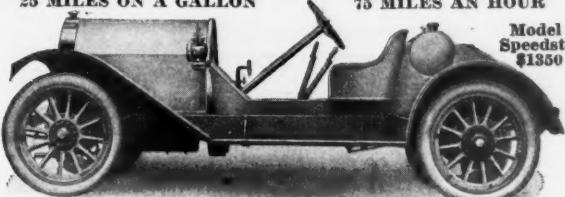
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THE REAL LONG STROKE MOTOR
4 1/4 Inch Bore (PERFECTED) 7 1/8 Inch Stroke
25 MILES ON A GALLON 75 MILES AN HOUR


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100 PER CENT EFFICIENT

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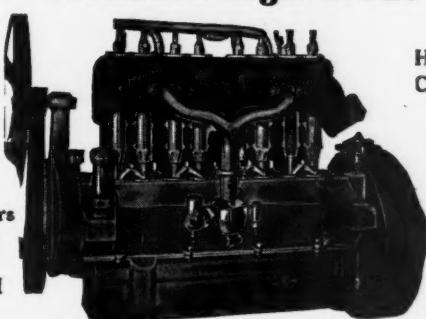
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4 Cyl., 5x5, 40 H. P., 4 Cyl., 4 1/2 x 5, 35 H. P.

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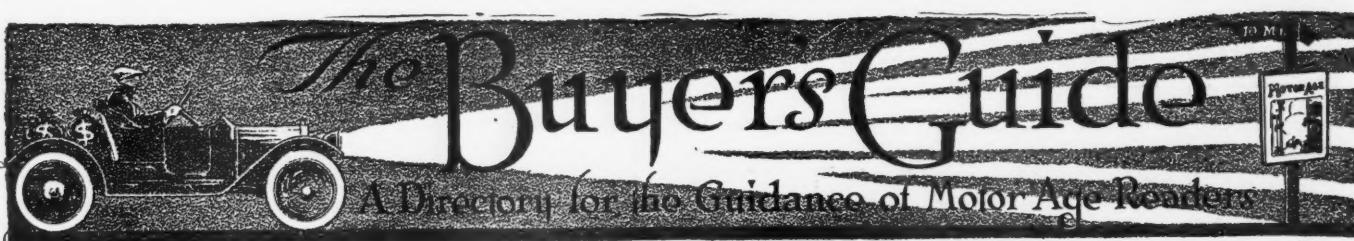
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COLUMBUS, OHIO

ANOTHER SLAUGHTER in AUTOMOBILE PRICES

This Time—The

"Mighty Michigan"

Every owner of one of these cars will tell you of its wonderful performance, its durability, its smooth-running qualities, and many other points of advantage. The Michigan Buggy Co., well known for many years in the carriage business, manufactured this car. They built it too good. They gave too much for the money. The car cost them 30% more to produce than for what they sold it for, sustaining a loss in the last year of more than Three Million Dollars, and were forced into bankruptcy. THEIR LOSS YOUR GAIN. Every one of these cars is absolutely guaranteed by us, and we will guarantee to supply you with parts for a period of not less than 5 years. Remember, there is only a limited quantity, some with electric starters, some without. Some 33 horsepower, some 40 horsepower.

33 H. P.
REGULAR PRICE, \$1,425

OUR PRICE

\$990

40 H. P.
REGULAR PRICE, \$1,625

OUR PRICE

\$1090

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New and Used Cars and Accessories

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There are forty of them
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NEAT, ATTRACTIVE COUPE BODIES BUILT ESPECIALLY FOR FORD CARS. WRITE FOR PRICE AND DESIGN.

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ELECTRIC STARTING & LIGHTING
ASSURES 100% EFFICIENCY

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"INSURANCE FOR
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RHINELAND MACHINE WORKS CO.
142 WEST 42nd ST. ----- NEW YORK

CLASSIFIED ADVERTISEMENTS

The Trading Center
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Motor Car Industry

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Cars For Sale

A LATE DOUBLE "M" FORTY HORSE- power White Steamer; fine condition and fully equipped, including kerosene burner. Has not run three thousand miles. Will sell. Address Box D 469, c/o Motor Age, w.

AUTOMOBILE-FOR SALE, A PIERCE-AR- row, with 7-passenger touring and limousine bodies; in perfect condition; 4 brand new tires; owner has excellent reason for selling. Price \$1,700. 4383 Westminster pl., St. Louis, Mo.

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A "13" CADILLAC DEMONSTRATOR, five passenger, in excellent condition, fully equipped; tires and paint good. Best offer buys it. Box 217, Buckhannon, W. Va. p

BRUSH RUNABOUT, 1911, NEWLY PAINTED and overhauled; good tires; fully equipped; extra tubes, tools; double ignition. Price, \$150.00. H. Kroeger, 1005 Caldwell, Louisville, Ky.

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DEALER IN GOOD SECOND HAND FORDS Bodies and equipments of every description. R. J. Trumbull, 1334 So. Michigan Ave., Chicago, Ill.

FOR SALE-DARK MAROON COLOR Buick 16. Good lines and very pretty car. Used but little and good as new. Cost with equipment about \$2,148. Make offer for quick deal. Owner, Limbach, 105 W. Monroe St., Chicago.

FOR SALE-FORD RACING CAR EQUIPPED with Bosch high tension magneto, water pump, high gear Rayfield carburetor, 3½-inch bore; will do 65 miles per hour on straightaway and has done a mile on half mile track in 1:12. It is a classy little car with lots of speed. Cheap for cash, or will trade for Oldsmobile Special, seven passenger. Address 308 North Washington St., Iola, Kas. p

FOR SALE-NEW MOTOR TRUCK, 2 TO 3 ton, 40 H. P., 4 cylinders stake body; cost \$2,500 take \$1,500. Will guarantee. Box D 545, care Motor Age.

FOR SALE-OLDSMOBILE LIMITED; JUST the car for the man in the motor livery business; seeing is believing; come in and look it over and make us an offer. Springfield Branch of Stevens-Duryea Company, 147 Chestnut St., Springfield, Mass.

FOR SALE-ONE 6-CYLINDER, 7-PASSENGER, 1913 Mitchell, with electric starter and electric lights; bought new July 5; run 2,000 miles; tires new; a bargain; cost \$2,500; our price, \$1,400. COLE MOTOR COMPANY OF MISSOURI 1512 Grand Avenue, Home phone, Main 1502. Bell phone, Grand 1500. Kansas City, Mo.

FOR SALE OR TRADE-60 HORSEPOWER car, double chain drive; would make a 2-ton truck. E. B. Collins, Danville, Ill.

FOR SALE-SECOND-HAND TRUCKS.
4 Decatur 1½-ton trucks.
1 Randolph ¾-ton truck.
1 Rapid 1-ton truck.
1 5-passenger Corbin touring car.
2 500-lb. light trucks.

Apply to L. W. Coppock at old plant Grand Rapids Motor Truck Co., Grand Rapids, Mich. Phone Citz. 7487.

FOR SALE-1912 OVERLAND, 40 H. P., 118 wheel base, 5-passenger. Has had the very best of care. Top body, tires, in fact everything just like new. \$600. Peebles Motor Car Co., Wilmington, Ohio.

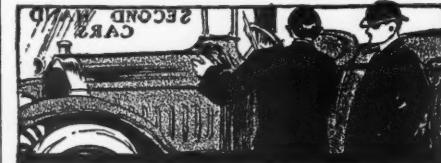
GARFORD SEVEN PASSENGER CAR, factory overhauled and in perfect order; 1911 model. For quick sale, \$1,000. Robt. Holmes & Bros., Danville, Ill.

HUPMOBILE 32 H. P. TOURING CAR, fully equipped, run 2,500 miles. LIKE NEW—CONDITION GUARANTEED. Snap to quick buyer. T. Sherow, Millbrook, N. Y.

LADIES' ELECTRIC COUPE AT BARGAIN price for quick sale; all parts in first-class condition; just rebuilt, painted, batteries renewed; car practically good as new. A. N. Evans, 1308 Arrott Bldg., Pittsburgh, Pa.

MITCHELLS, REBUILT, GUARANTEED. These cars are fully equipped. Call or write for further particulars. Mitchell Automobile Co., 2334-36-38 Michigan Ave., Chicago.

PIERCE FOR SALE-1910 "48" SEVEN- passenger touring car, motor just overhauled at factory, new tires, seat covers and Klaxon horn, entire car in excellent condition—\$2,300. Owner has purchased Ohio electric, reason for selling. Blake Auto Co., Colorado Springs, Colo.



A Good Reason

"We do not care to repeat the advertisement in reference to the Knight car at this time. We sold it through the MOTOR AGE advertisement. That's why." H. H. W.

PREMIER LITTLE 6-40, 1913; mileage under 3,200 and guaranteed as good as day received from factory. Rare chance to get a high grade car at a bargain. Cost with extras over \$2,900; price only \$1,600. No trades. C. G. M. Bond, Winchester, Mass.

1913 CHANDLER LIGHT WEIGHT SIX, RUN about 500 miles and practically good as new; \$1,100; 1913 Big Six Lozier, self-starter and full equipment; repainted and has new tires; looks like new; \$2,600. Archambault Motor Sales Co. 197 Ogden Ave., Milwaukee, Wis.

30-36 STEARNS SHAFT DRIVE 7-PASSENGER touring car fully equipped, having Continental demountable rims. I also have a limousine body suitable for this car, which is in excellent condition. Either or both of the above will be sold very cheap. Address G. M. Dias, 101 Main St., Johnstown, Pa.

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ACCESSORY CATALOG MAILED ON REQUEST. Maxwell dealers and owners, we can supply tops, shields, etc., for your cars. Lower prices, all goods. Write us. Westchester Accessories Co., 1777 Broadway, N. Y. City.

A-1

RADIATORS

A stronger, better and fine appearing radiator, not a rebuilt or cheaply constructed job.

WE GUARANTEE IT NOT TO LEAK THROUGH FREEZING OF WATER FLOWS

Ford T (special construction)	\$20.00
Ford T (honeycomb type)	30.00
Overland 69	30.00
Buick 10	26.00
Buick 16-17	31.00
Hudson 20	30.00
E-M-F 30	28.00

Prompt delivery. Terms, 2 per cent discount for cash with order, or one-third cash, balance C. O. D. Get our quotations on those not listed. We can make any radiator.

DETROIT RADIATOR & SPECIALTY CO.
963 Woodward Ave., Detroit, Mich.

ATTENTION BUYERS, JOBBERS AND DEALERS.

We are over-stocked. Double locks, reliners, all sizes. Special price for quick sale. Wire at our expense.

AMERICAN RUBBER PRODUCTS CO.,
28 S. Clinton St.,
Chicago, Ill.

ATTENTION—HENRY OWNERS

Having purchased the repair business of the Henry Motor Co., we are prepared to fill orders promptly for repairs for Henry cars. Muskegon Automobile Co., Muskegon, Mich.

ATTENTION, WHITE STEAMER OWNERS! One Model "M" engine complete; one Model "O" engine complete; one Model "F" and "L" crankshaft complete; generators, burners, axles, wheels, springs and numerous other parts for any model cheap; also one fine straight line, seven passenger body and one seven passenger limousine body cheap; one good seven passenger White Steamer with kerosene burner, \$250; a snap. Address Box D 551 c/o Motor Age. W

THE JONES AND BUCKOKE (J & B)

AUTOMATIC FUEL-SAVING DEVICES are established for all time. FITTED TODAY AN INSTITUTION TOMORROW.

Prices \$3.75, \$8.00, \$15.00. All suitable for any motor. Communicate direct. Sole address Germania Auto Repair, 1551 N. La Salle St., Chicago, Ill.

A WHITE STEAMER, GENERATOR AND burner, almost new. Will sell cheap. Address Box D 245, c/o Motor Age. W

AUTO BODIES, WINDSHIELDS, WHEELS. 250 new panel top delivery bodies, some panel top, some open express with flare boards. Will fit three-fourths of autos made. \$28 to \$45. Folding plate glass windshields. \$10 complete. New 32-inch wheels with solid rubber tires, only \$12 each. Benedict Co., 63 Winder St., Detroit, Mich.

AUTO PARTS MAKERS. Repair and service parts for many cars. We own all patterns and parts in stock for Elmore, Warren, DeMott, Welch, Rainier, Marquette, De Luxe and other cars. Complete stock.

Puritan Machine Company, Detroit, Mich.

MR. DEALER

ARE YOU BUYING SUPPLIES RIGHT?
TO CONVINCE YOURSELF SEND FOR
OUR NO. 800 BARGAIN SHEET
WITH DISCOUNT SHEET FOR
QUANTITIES

ANOTHER AUCTION SALE
GOODS BELOW MANUFACTURERS' COST

11 Herschell-Spillman motors, 6 cylinder, 1914 type.....	\$275.00
76 6 cylinder Briggs Magneto and coils.....	18.00
50 pr. nickel flush dash electric lamps, per pair.....	1.50
38 4 and 6 cylinder Atwater - Kent Unisparkers, each.....	21.00
4 6 cylinder pressed steel frames with fittings.....	20.00
100 6 cylinder pressed steel frames.....	10.00
90 6 cylinder 5 and 7 passenger bodies in prime coat, up-to-date, hinges and locks, ironed for top.....	25.00
45 Silk mohair tops to fit, with curtains.....	18.00
15 Remy magneto switches and cable, each.....	1.50
4 Elsemann coils and switches, each.....	8.00
Lot Splitdorf switches for magneto, each.....	1.25
11 Smith axles, full floating, per pair.....	60.00
3,551 Machined valve stem, tungsten steel, each.....	.20
90 Spicer joints 1 1/4 in. sq., one end taper on other.....	7.00
90 Spicer joints 1 1/4 in. sq. with slip joint.....	7.00
40 5 and 6 passenger fore-door bodies painted and ironed for top.....	40.00
70 Finished dashes mahogany with binding.....	1.00
117 Gasoline strainers with pet cocks, each.....	.90
54 Detweiller steering gears, nickel plate, with 18 in. corrugated wheel, left hand steer.....	15.00
100 New Gibney Elec-trick Vulcanizers.....	5.00
500 Midland wheels 34x4 Q. D. rims, each.....	2.00
150 Bulls Eye oilers for dash, each.....	.90
288 Dash Gasoline Pumps, complete, each.....	1.00
148 Cans Olin Radiator compound, \$2.00 size, each.....	.50
65 Speedometer shafts, Warner list, \$5.00, each.....	1.50
30,000 ft. secondary cable, like Packard, list, \$2.20, per foot.....	.03
32,000 spark and throttle ball sockets, list, \$.20, each.....	.04
10,000 Coil springs, 2-4-6-8 in. long, 1/2 in. dia, each.....	.02
600 ft. 1 1/2 in. aluminum flexible tube, per foot.....	.15
564 Hood fasteners, each.....	.15
208 Door handles, brass and nickel, each.....	1.00
120 Midland fenders, enameled, each.....	1.00
30 Midland mud aprons enameled, per pair.....	1.00
10 Midland second hand tops, each.....	1.00
1 Midland 4 cylinder motor, second hand, complete.....	5.00
231 Baker demountable rims extra, 34x4 Q. D. and C., each.....	2.00
2,040 Pet cocks, brass, each.....	.08
1,000 Timken bearings, nearly all sizes, each.....	1.00
40,000 ft. aluminum moulding, per foot. 40 sets 34x4 demountable wheels, per set.....	.10
Completed painting outfit with brushes and paint for Ford cars.....	18.00
Sheldon one-ton truck axles, per pair.....	5.00
One-ton truck wheels with rims, per set of four.....	25.00
K-W high tension magnetos complete.....	8.00
Ford Model T Radiators.....	25.00
Ford honey-comb radiators, Model T.....	18.00
Buick Model 17 radiators.....	23.00
Four-cylinder 40 H. P. Continental motor.....	21.00
Cone clutches with universal joint.....	250.00
Steering gears with 18-inch wheel.....	12.00
Sheldon shaft drive rear axles, complete with front axles.....	10.00
A. O. Smith pressed steel frames.....	50.00
Brown-Lipe type shifting levers, H quadrant.....	3.00
Honey-Comb radiators with hood.....	7.00
And thousands of other parts for MIDLAND CARS.	10.00
Write for price in lots of 12 or more.	
ABOVE PRICES FOR 30 DAYS ONLY.	

AUTO PARTS CO.,
513-31 Jackson Blvd.,
Chicago.

BALL & ROLLER BEARINGS.
All Types and sizes.
We also repair or exchange all makes of ball bearings.
THE GWILLIAM CO., 253 W. 58th St., N. Y.;
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BARGAINS.
Viso spark plugs; a glance shows missing cylinder; solves ignition troubles. Sample mailed on receipt of 25c. Storage batteries \$7.50 to \$16.00. Electric head lamps only \$7.50 pair.

The Ampvo Battery Co.,
3031 Michigan Ave., Chicago, Ill.

BERGDOLL REPAIR PARTS.
The repair business of the Bergdoll cars, together with all drawings, jigs, patterns, etc., has been purchased by us. We have a complete stock of repair parts for all models on hand and orders for parts for Bergdoll cars should be placed with us direct to save time.

Louis J. Bergdoll Motor Co.,
124 N. 3rd St., Philadelphia.

COMPLETE "VULCAN PROCESS"
of oxy-acetylene welding
plants from \$175 for the blacksmith and garage plant up to largest made. Torchlight weight. No backfiring in ordinary work.
Write today for our booklet on welding.
Vulcan Process Co.,
25th and University Ave. S. E.,
Minneapolis, Minn.



More Than Satisfied

"Please change our advertisement to read as per enclosed matter. Run until further notice. We have steadily secured excellent results from our ads in MOTOR AGE and are more than satisfied."

L. D. S.

COMPLY WITH THE LAW
Use a DIM-A-LIGHT for your headlights. By turning switch reduces light 25 per cent. \$3.50 complete.

Pellets Magneto Exchange,
1463 Michigan Ave., Chicago, Ill.

CUT-OUTS.

E.M.F., Flanders, Buick, Regal, etc. Complete outfit with brass lock open pedal, \$1.50 Lincoln Machine Shop, Lincoln, Ill.

DOES YOUR MOHAIR AND CANVAS TOP
leak? Coleman's Waterproof Filler will make it rainproof. It will not stiffen or change the color. Virginia Waterproofing Corp., Arcade Bldg., Norfolk, Va.

DRAGON REPAIR PARTS.

We manufacture and keep on hand all repair parts for the Dragon cars. We make a specialty of repairing this machine. Philadelphia Machine Works, 67 Laurel St., Philadelphia, Pa.

FORD OWNERS—WE CAN MAKE YOUR
car the easiest rider made with light or heavy load; no jolt, no jars, no upthrow. Write us. Thomas Auxiliary Spring Co., Canisteo, N. Y.

FORD CAR WIRE WHEELS.

Demountable wire wheels interchangeable all around, built especially for Ford cars. Five wheels to a set, enabling you to carry spare wheel with inflated tire, and make quick change.

THE F. & H. WIRE WHEEL CO.,
Columbus, Ohio.

FORD FAN BELTS, WOVEN COTTON AND
silk; outlasts six regular belts. Postpaid, 60c. Dealers, write. Angier's, Streator, Ill.

FOR FORD OWNERS ONLY

Wouldn't it be a source of satisfaction to you to be able to leave your Ford for an hour or a day without fear of theft? You can buy just such satisfaction for \$1.50, the cost of a

KIMBALL SAFETY CRANK-HOLDER
This attachment for Ford cars is absolute insurance against theft. It also holds crank rigidly in place and

PREVENTS RATTLE WHEN CAR IS
RUNNING
Can be attached to car in five minutes without alterations.

The short days and long, dark nights are coming—the auto thief's harvest time. Fool him—get a Kimball holder and lock today. For sale at Ford agencies or sent prepaid on receipt of price—\$1.50.

Responsible Dealers Wanted
Northern Specialty Co.
Crystal Falls, Mich.

FORD, HUPP AND MAXWELL
Muffler cut-out, machined ready to attach, including lock open pedal string and cables, \$1.85. Lincoln Machine Shop, Lincoln, Ill. c

FORD LIGHTING OUTFITS, \$5.50.
Includes parabolic reflectors, tungsten bulbs, wiring switch and free delivery. Truscott Auto Supply Co., St. Joseph, Mich.

FORD OWNERS AND DEALERS!

You will save trouble and money by installing our timer elevating device.
Ford Parts Specialty Co.,
1211 Main St., Richmond, Ind.

FORD OWNERS—OUR SPARE DEMOUNTABLE
wheel cures tire trouble on road. Doctors, attention. Write Angier's, Streator, Ill.

FORE DOORS

We are prepared to make prompt shipment from stock and guarantee the doors to fit or money returned.

F. E. LORTZ CO.,
1547 So. Mich. Ave., Chicago, Ill.

FORD OWNERS.

Enter your order with us at once and take advantage of the following bargains while they last.

Ford Lighting Outfits.....\$ 5.50
Clamp On Ford Bumpers..... 4.00
Spark Plugs..... .35
Electric Horns, "Electra and Bulldog"..... 2.90
Ford Oil Gauges..... .35
Ford Valve Stem Adjusters..... 1.25
Tires 30" x 3" New..... 9.75
Tires 30" x 3 1/2" New..... 14.00

Write for list on other bargains. Terms, cash with order. Money back if not satisfied.

AUTOMOBILE SUPPLY & MACHINE CO.,
50 Rowland Bldg., Detroit, Mich.

FORD T. OWNERS.

Foot throttle or accelerators, \$1.50. Lincoln Machine Shop, Lincoln, Ill. c

FORE-DOORS AT CUT PRICES.

Mr. Auto Owner and Dealer: If your car is without fore-doors, write today for bargain prices; to reduce stock.

DEPT. D., AUTO SPECIALTY MFG. CO.,

326-30 E. Market St.,
Indianapolis, Ind.

FOR SALE—CINO RACING MOTOR, complete with double spark Remy racing magneto, \$175.00. Model N Ford engine and transmission, \$75.00. Three speed Brown Lipe trans. selective type, \$40.00. Type "17" Buick Motor Complete; Clutch, Magneto and Carburetor, \$150; Type "17" Buick Transmission, \$35.00. 24 H. P. Pope Engine, \$50. Pope Toledo parts for sale.

Auto-Salvage Co.,
1436 Wabash Ave., Chicago.

FOR SALE — TAXICAB BODIES, 5 months' service. Refinished. Original price, \$600. My price, \$200. E. B. Collins Motor Co., Danville, Ill.

LION REPAIR PARTS.

We have on hand a complete stock of repair parts for all models of Lion Cars.

Lion Motor Parts Co.,

124 N. 3rd St., Philadelphia, Pa.

FOR SALE.	
36-42 H. P. "L" Head Motors, 4 1/2 x 5 (Continental type), with cone clutch.	\$250.00
Brown and Lipe sub-frame transmission, three speeds forward and one reverse, with shifting quadrants and lever "H" shift.	50.00
Cone clutches with joint and cross and spring.	12.50
18" hand wheel worm and gear steering gears (Gemmer type).	12.50
Sheldon front and rear axles, shaft drive for car up to 30 H. P. with artillery wheels and demountable rims.	82.50
A. O. Smith steel frames for 110-inch wheel base.	10.00
Driggs-Seabury heat treated steel frames for 121-inch wheel base with kick up for three-quarter elliptic springs with all fittings for springs front and rear and standard-size sub frame.	15.00
Brown and Lipe shifting levers "H" with quadrants.	12.50
Radiators with bonnet ledge for cars up to 30 H. P.	11.00
Apply to G. J. G. Motor Car Company, White Plains, N. Y.	

HAYNES MODEL W—2ND HAND PARTS
—Practically complete car in parts as wanted at 25% value. Includes magneto. No tires or crankshaft. Good condition. Farm Mutual Tel. Co., Grimes, Ia.

"JIFFY" SIDE CURTAINS FOR FORD
cars. Everything complete ready to attach to bows. Touring \$15; Roadster \$12.50. Price-list curtains for all cars on request.
HERCULES RUBBER CO.,
"Jiffy Curtain Division."
No. 2 Hudson St., New York.

MAGNETOS: WE HAVE 2,000 MODEL X
Splitdorf Magnets, new. Price, without coil, \$17.50 each; with coil, \$25.00 each. The regular price of these is \$75.00.

We also have other makes of magnetos at cut prices—in fact, everything for the automobile. Send for "OUR PRICE WRECKER"—the greatest money saver in the world.

TIMES SQUARE AUTO CO.,
1210 Michigan Blvd., Chicago Ill.
S. W. Cor. 56th St. & Broadway, N. Y. City.

MAKE CASH OFFER FOR
O. B. PORTABLE AIR COMPRESSOR.
Practically new, suitable private or small public garage. Bids kept open one month. Any bid may be rejected. Address Box D 512, h/o Motor Age.

MORA REPAIR PARTS.
We purchased the repair business of the Mora Company and have in stock repair parts for all models of Mora cars.

Philadelphia Machine Works,
67 Laurel St., Philadelphia, Pa.

PREPARE FOR WINTER.
You will want a Hand Warmer to keep you comfortable and warm. We have a perfect Hand Warmer. They simply lace on your steering rim. Do not mar the rim; easy to put on or take off. Fit on any rim or car. They are comfortable and neat looking. They use very little current. Operate on current from the Ford magneto storage battery or lighting system. Sold on the money-back guarantee. See your dealer or write us direct.

Motorist Warm Grip Co.,
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PAINT YOUR CAR YOURSELF

Save \$25 to \$75 by doing the work at home with the Arsenal system. Our big free booklet, "The Car Beautiful," tells how. Send for it today.

ARSENAL VARNISH COMPANY
Auto Dept., Rock Island, Ill.

RADIATOR COVERS FOR ALL CARS.
Every car should have a radiator cover in cold weather.

Write for prices.
Auto Cape Top Co.,
2334 Michigan Ave., Chicago, Ill.

MR. (FORD) OWNER AND GARAGE MAN.
The Townsman Valve Adjuster has a cushion for your valve-stems. Takes away the click, absolutely silencing the valves. No screws or burrs to work loose. Saves putting in new push-rods and valve-stems. They never wear out. Price \$1.50 by mail. Ask your jobber, or address Townsman Auto Specialty Co., Mitchell, S. D.

RADIATORS.

Every radiator guaranteed absolutely new, not a reconstructed one.

In stock for immediate shipment.

Ford Model "T".....	\$18.00
Buick 10-14.....	27.50
Buick F-16-17-19-26-27-28.....	35.00
Hudson 20.....	33.00
Chalmers F-40.....	30.00
Hupp 32.....	25.00
E-M-F 30.....	30.00
Anhut.....	15.00
Northern C.....	32.00
Wayne 30.....	35.00
Special 40 H. P.	15.00

5% discount allowed for cash with order, otherwise one-third cash with order, balance C. O. D.

We also have all repairs for the Wayne, Queen and Northern cars.

AUTOPARTS MANUFACTURING COMPANY

453 Trombly Avenue, Detroit, Mich.



Positions Filled

"I have filled the positions referred to, and have received numerous applications, so discontinue the ad. Rest assured that when we need additional salesmen, we will take pleasure in giving you the advertisement." E. H. C.

RADIATOR COVERS

Full stock for all cars

Prompt shipment

Ford covers, \$1.40; other cars, \$2.50.

Allen S. Sinsheimer

1505 Michigan Ave., Chicago

RADIATORS—NEW GUARANTEED GOODS

Ford, Model T..... \$16

Buick, Model 10..... 22

Buick, Model F..... 25

Chalmers-Detroit..... 20

Everett..... 20

Stoddard-Dayton..... 25

Any other make required at equally low prices.

The Times Square Automobile Co.,

1210-1212 Michigan Ave., Chicago.

RIMS, RINGS AND RIM PARTS FOR ALL

rims made. Send for our rim part catalogue.

KASTNER TIRE AND RIM CO.,

2112 Michigan Ave.,

Chicago, Ill.

"SAVE YOUR GASOLINE."

We have 150 Rayfield carburetors, regular

\$20.00 kind. Our price, \$8.20 while they last

PURITAN MACHINE CO.,

415 Lafayette Blvd., Detroit, Mich.

SCHEBLER MODEL "L" CARBURETORS,

new, 1 1/2-inch, \$8.00 each. Order early.

Kent Motor Car Co., Kenosha, Wis.

SHINAUTO—THE GREAT PRESERVER.

Keeps auto like new without washing.

Prevents cracking and checking of varnish.

Makes old cars like new. Guaranteed. Saves

paint bills. Trial can, 50c by mail. Enough

for two months' treatment.

SHINAUTO MFG. CO., INC.,

1137-1139 No. Illinois St., Indianapolis, Ind.

SPECIAL BARGAINS

Rutenber motors, 4 cylinder model 27, 3 1/4 x 4 1/4, brand new with magneto attached; fan, starting crank, etc. Price, \$225.00.

Fore door bodies, six and seven passenger, painted, ironed for top, untrimmed, \$25.00. Fore door bodies, ironed for top, untrimmed, \$20.00.

BEARINGS. No. 316 Hess Bright, R. I. V., New Departure and S. R. B., \$9.50 each; No. 219 D. W. F., 95 A-F & S, and 1219 S. K. F., \$8.50 each; No. 314 S. R. B., 15 B-R. I. V., \$7.50 each; No. 411 D. W. F., 9 C-R. I. V., 55 C-F. & S., 411 S. R. B., 1411 New Departure, \$6.75 each. Other sizes also on hand.

Automobile Appliance Co.,
1712 Michigan Ave., Chicago, Illinois.

TOPS BUILT, RECOVERED AND RE-
paired. Also Top Covers, Radiator Covers, Luggage Cases, Celluloid, etc. C. G. Meyer & Son, Tiffin, Ohio.

TOPS, NEW OR RECOVERED; CUSHIONS
and Backs, new or recovered; Carpet Rugs; Curtains; Dust Covers, etc. W. H. Newton & Son, 120 Elm St., Cortland, N. Y.

TOURING, ROADSTER, RACING BODIES.
Seats, special and stock sizes. Radiators, hoods, tanks and fenders for any car. Get our prices.

Auto Sheet Metal Works,
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WE MAKE FORD RACING TYPE BODIES
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axles, \$45.00. Other bargains, too.
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If you want to equip your car with a high grade, up-to-date Windshield, these money-saving bargains will interest you.

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—30 CENTS ON THE DOLLAR—

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See our fine lot of Auto tops made for Flanders "20" Touring cars; finest mohair upholstery and elegant finish; complete with irons, side and storm curtains. Can be made to fit a Ford or Buick "10" Touring Cars. PRICE \$11.85

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Accessory Department

WE NOW HAVE BUT A FEW 30-35 AND
35-40 H. P. motors ready for shipment.
Complete with magneto, coil and clutch. F. E. Alford, Goshen, Ind.

\$50.00 AIR COMPRESSORS, \$18.00; FORD
lighting outfit, \$2.90; Coupe bodies, \$65.00; Clamp on bumpers, \$2.95; Ford master vibrators, \$5.50, 6-80 storage batteries, \$9.50; Electric horns, \$2.95. Fred Allen Auto Supply Co., 1610 Michigan Ave., Chicago, Ill.

WE TEAR 'EM UP AND SELL THE PIECES

We want old autos, condition no object. We will buy anything for the auto. We have all kinds of parts, many of them new, at unheard of low prices. Tires and tubes, many new, others used. Kingston carburetors, all sizes; will exchange for others. Gears of all kinds, new gas oval tanks, new timers, magnetos, coils, Stewart speedometers, shafts and chains, tire covers, dust hoods, electric horns, new nightingale whistles, complete with fittings, brass bumpers, lamps, all kinds, Prest-O-Lite tanks, oilers, cylinders, pistons, transmissions, crankshafts, seats and bodies; new 30x3 1/2 wheels, many other used sizes, rims; several chassis without engines, 2-cylinder engines, springs; in fact, everything that an auto needs. Correspondence solicited. If we do not have it, will advise you where you can get it.

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1913 FORD ROADSTER BODY WITH TOP and side curtains, \$35.00. 1913 Ford Touring Car Body with top and side curtains, \$60.00. MacInnis Bros., Toledo, Ohio.

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FIFTY CARS WANTED FOR CASH. Have customers waiting; if you want to sell your car quick, consign it to us; no charge whatever; we get our profits over your net figure; it is your privilege to remove car at any time without notice; will send for your car free within 200 miles.

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Enclosed find check in payment for advertising in MOTOR AGE, two insertions. We have had good results from this ad and you will herewith find enclosed copy for six more insertions." A. H. Y.

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31-3½	10.45	3.25	36-4	15.75	4.70
32-3½	10.60	3.40	35-4½	19.00	4.80
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63F



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for 1914—Big Red Ones

The Indian Equipment—

ORBIN-BROWN
SPEEDOMETER

"The Speedometer of Absolute Accuracy"

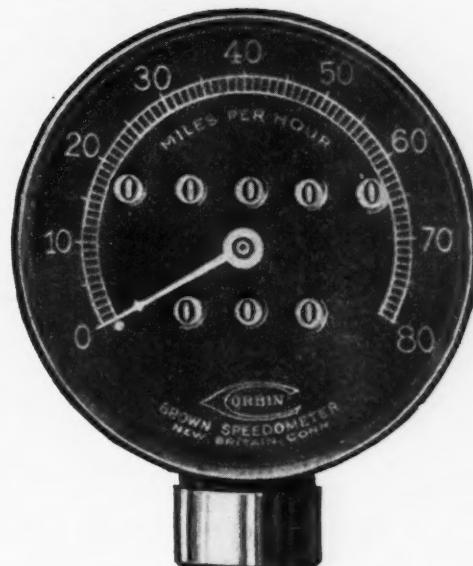
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The Corbin-Brown Speedometer was selected only after the most exhaustive tests for accuracy and dependability.

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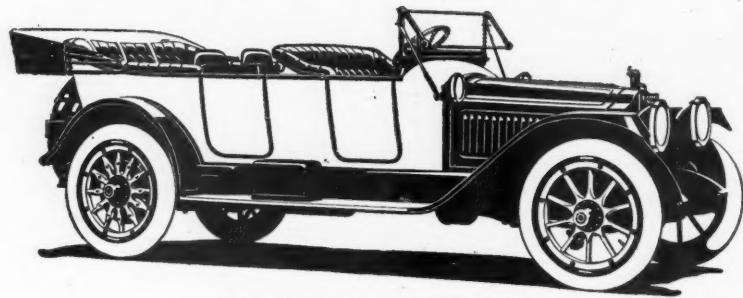


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BRANCHES : New York Chicago Philadelphia

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THE SPECIAL TOURING CAR

Packard "2-38" touring chassis, with special six-passenger body, thirty-three hundred and fifty dollars. Body is of Packard design but not of Packard manufacture. To meet a popular demand for the Packard maximum service chassis, equipped with a moderate service body, this vehicle is offered at five hundred dollars less than the Standard touring car.

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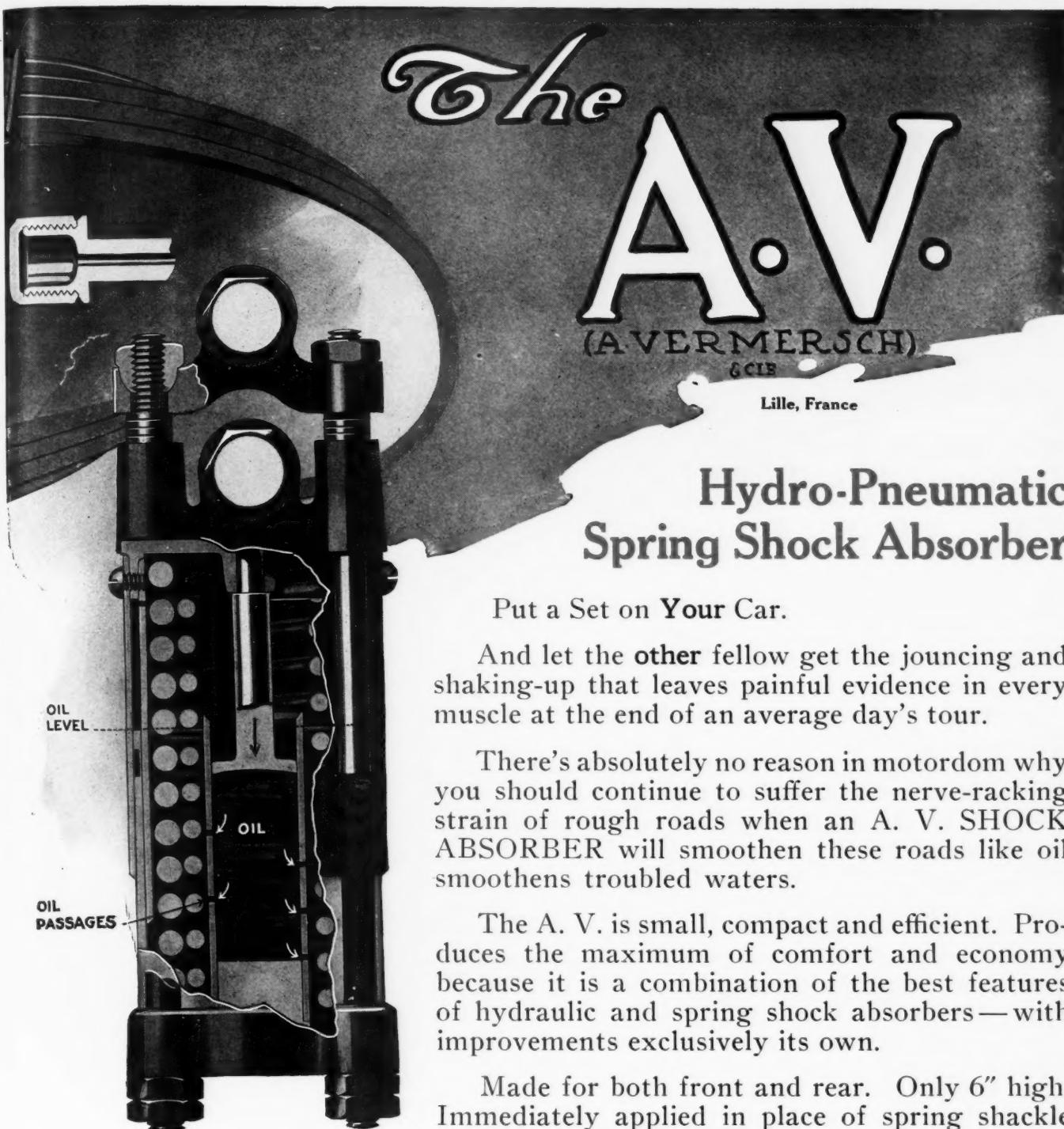
Packard sales for the fiscal year just closed were far in excess of any previous twelve months—another sweeping endorsement of Packard methods and Packard quality.

Twenty styles of open and enclosed bodies. Only a demonstration can convey what it means to drive a Packard

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Packard Motor Car Company, Detroit

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 (AVERMERSCH)
& CIE

Lille, France

Hydro-Pneumatic Spring Shock Absorber

Put a Set on Your Car.

And let the other fellow get the jouncing and shaking-up that leaves painful evidence in every muscle at the end of an average day's tour.

There's absolutely no reason in motordom why you should continue to suffer the nerve-racking strain of rough roads when an A. V. SHOCK ABSORBER will smoothen these roads like oil smoothens troubled waters.

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Made for both front and rear. Only 6" high. Immediately applied in place of spring shackle without special attachments.

Price \$35.00 Per Pair Up

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Friction, which is essentially a pulling process (you can feel frictional pull if you hold your hand around a rapidly revolving shaft) pulls the surface particles from their hold. This is "wear." You can see the particles that are worn from a piece of chalk, when you write on a blackboard. You can't see the particles worn from a piece of bronze, but the process is the same.



Is the Longest Wearing Bearing Bronze

because its particles are interwoven, so that they resist frictional pull. It is because of this fibrous and interwoven structure of Non-Gran that it wears twice as long as the "top-notcher" of all other bronzes, all of which are granular in structure.

There is the same difference between Non-Gran and other bronzes as there is between a wood-block pavement and a gravel road. One is fibrous—the other granular. Just good, common sense will tell you which wears the longer.

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